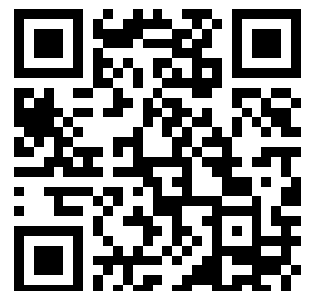

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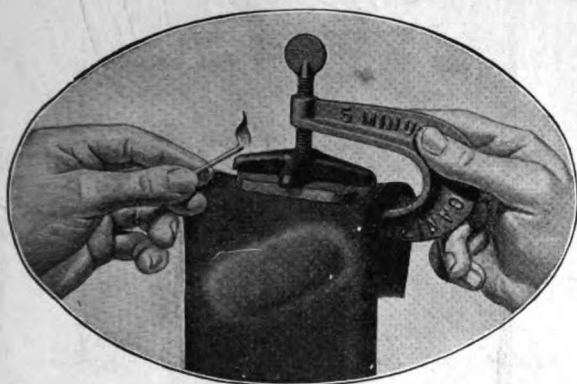
AMERICAN GARAGE & AUTO DEALER

Published Monthly
118 So. Michigan Ave.
CHICAGO, ILL.

JANUARY

1919

Vol. 10 — No. 1
10 Cents the Copy
\$1.00 Per Year



(A Million Motorists Use It) 4,000,000 More Need It

The limited supply and increasing cost of inner tubes make it necessary for motorists to repair punctures, cuts, tears and cracks—to keep their tubes in good repair—as good as new.

Present conditions make it imperative for motorists to stop the easy-going, wasteful habit of carrying \$5 to \$15 worth of spare tubes—that deteriorate quickly—and scrapping perfectly good inner tubes that merely have a puncture, cut or tear—which can be repaired *permanently* with a Shaler 5-Minute Vulcanizer, quicker than a new tube can be inserted.

Saves Tubes — Saves Repair Bills

You can repair your own tubes—as good as new. It's easy and inexpensive. *The Shaler works automatically*—and without fail. Just touch a match to the non-flaming chemical fuel. In five minutes you have a firm, flat, "feather-edge," permanent repair—stronger than any "stuck on patch"—stronger than the tube itself. No gasoline, cement or flame, and no danger of injuring the tube. Carry it in your tool box for emergency use. It works in the wind, in any weather, anywhere. The heat is applied directly to the pure gum patch and does not extend to the tube itself.

Complete With 12 Patch and Heat Units \$1.50

The outfit includes the Vulcanizer—12 Patch & Heat Units (6 round for punctures, and 6 oblong for cuts)—complete, \$1.50. Extra Patch & Heat Units 75 cents per dozen.

Sold by All Accessory Dealers and Jobbers

TO DEALERS—To insure shipments—it is advisable to order from your jobber now. The great demand has exceeded our factory capacity, and shipments will be made according to priority in receipt of orders.

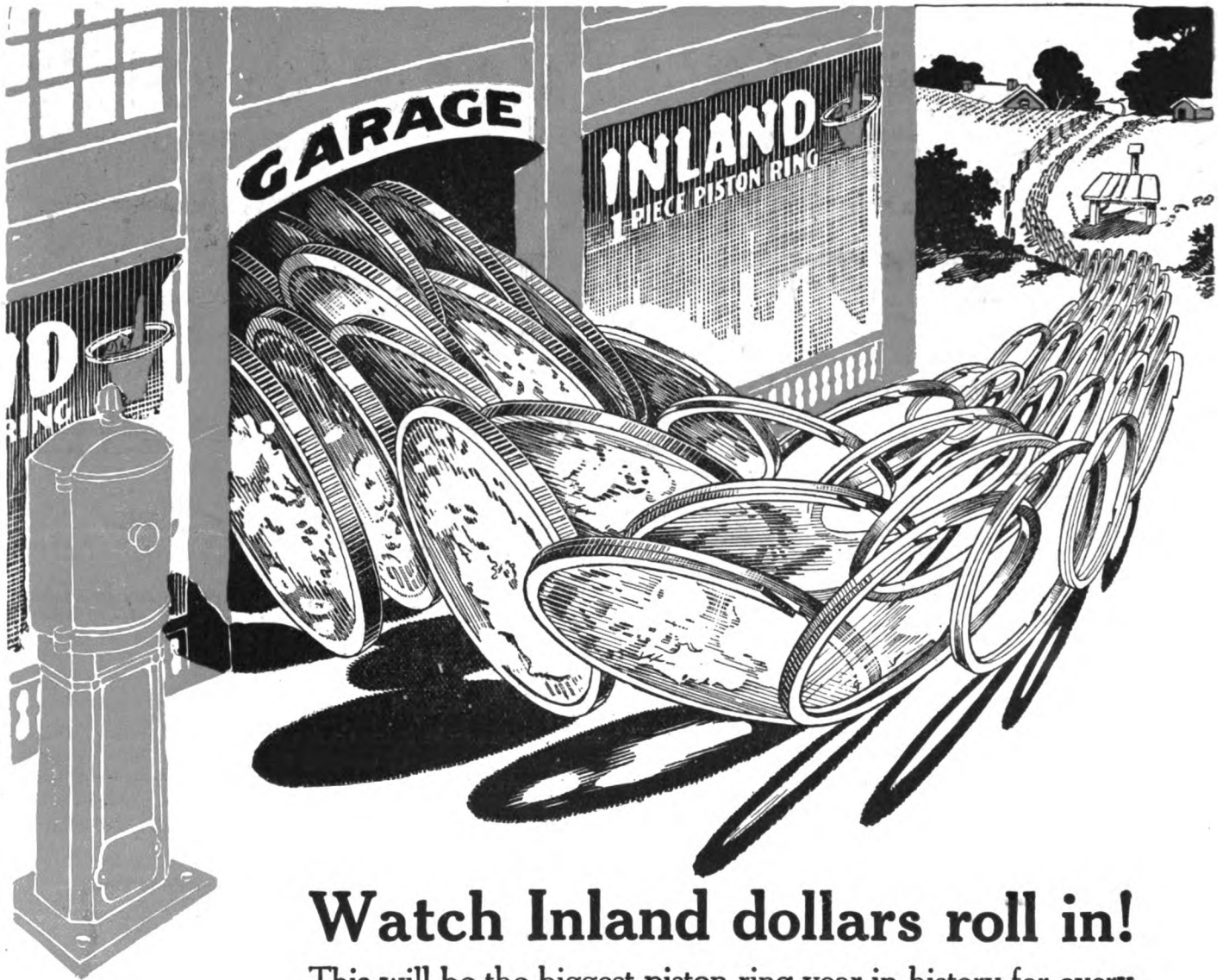
Catalog of the Complete Shaler Line of Vulcanizers for Motorists, Repair Shops and Garages mailed on request.

C. A. Shaler Co., 350 Fourth St., Waupun, Wis.

Oldest and Largest Manufacturers of Vulcanizers



Mends Tubes in 5 Minutes

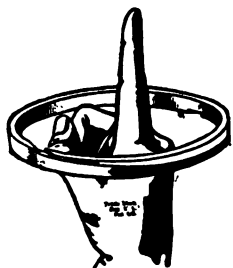


Watch Inland dollars roll in!

This will be the biggest piston ring year in history for every dealer who handles the piston ring motorists now demand.

Our advertising now reaches *all* owners of all classes of engines

—automobiles, trucks, tractors, stationary engines, motor boats, etc. We are using full pages and half pages in the Saturday Evening Post, Country Gentleman, Sunset, Successful Farming, Progressive Farming, and scores of auto papers, motor boat magazines, and foreign publications.



**3,000,000
Inlands are
now in use.**

INLAND

ONE-PIECE PISTON RING

will be *first and foremost* in the minds of those who have any interest in piston ring usage. The Inland sign on your place will bring you the overhauling and accessory business of your district. Get a stock of Inland Piston Rings now—jobbers everywhere carry them.

Inland Machine Works, 1645 Locust Street, St. Louis, Mo.

1952
9

Advance

Automobile Accessories Corporation

Announces

Another

Big Money

Maker

"Next Best to Cork Insert"

Here is important news to every jobber, dealer and Ford owner. A far better transmission fabric for use in Ford cars has been produced. After months of research and experiment the Advance chemists have made a great discovery. They have developed a chemical treatment which makes transmission fabric resist the scalding hot oil. **IT STAYS SOFT AND KEEPS ITS BRAKING EFFICIENCY.** They also have perfected the method of applying the new treatment so that it penetrates every tightly-woven fibre.



Means More Money to the Trade on Ford Lining Sales

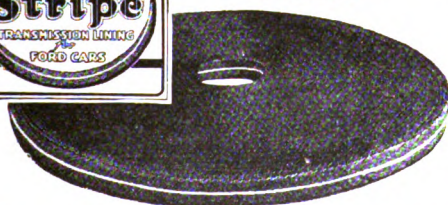
It will change more of your business on Ford lining from the no-name kind to the trade-marked kind. It will mean more money to you and better value and satisfaction to the consuming trade. Being sold both in boxes and from the roll, it answers every need of dealer and consumer.

Jobbers will want to catalog White Stripe Lining. Attractive electros have been prepared and are awaiting your request. White Stripe is bound to prove another big money maker for the trade. First—because it is the best transmission fabric for use in the Ford car ever produced. Second—because every foot of the lining is marked by the distinctive white stripe for ready identification.



In Boxes
\$2 per set of 3

Rockies west, \$2.25
Canada \$3



In Rolls 32 cents per foot
Rockies West, 35c Canada, 40c

Send Coupon for Set of White Stripe Lining

White Stripe fills a real need. It supplies the trade with another popular and fast selling accessory. It supplies the Ford owner with lining for the car that will stay soft and hold its good working qualities longer than any other plain fabric.

■ ■ **ADVANCE AUTOMOBILE ACCESSORIES CORP.** ■ ■
Dept. A7-1, 56 East Randolph St., Chicago

For Ford Owners

■ Enclosed is \$..... for set of
■ three White Stripe Transmission
■ Linings for Fords.

■ Name.....

■ Address

■ City.....State.....

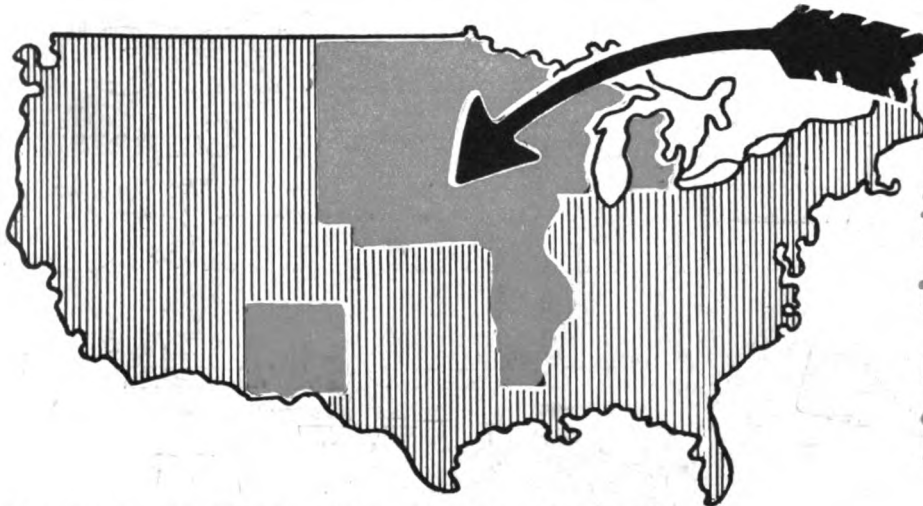
For Dealers

■ Send sample set of Advance
■ White Stripe Transmission Lin-
■ ing through following jobber.

■ Name.....

■ Address

■ City.....State.....



**There's BIG
BUSINESS
in these states
for the right sort
of MIAMI
DEALERS**

If you would like to have the agency for MIAMI TRAILERS in any of the following states: Michigan, Wisconsin, Minnesota, Iowa, Missouri, Arkansas, Kansas, Nebraska, North and South Dakota, and New Mexico, **please communicate with us.**

Energetic dealers can make big money selling MIAMI TRAILERS. Let us show you what others are doing, and what you might anticipate in profits from this agency. To be a MIAMI DEALER is to be accredited with one of the best agencies in any territory.

The MIAMI TRAILER CO.
TROY (Miami County) OHIO



Have you a "Piston Ring Primer" in your pocket? It has 16 pages of valuable information. Free to you.

Ever-Tyte Bill

**Says:- Down With Ottocracy!
Up With Democracy!!**

The way I got it figgered out, this makin' the world safe for Democracy is sort o' gettin' the world back to that little old Golden Rool.

This here kaiser and some of these other bosses had her workin'—"Do others or they'll do you." Now we're comin' back to "Do to others as you would want to be did by."

You know that little old-fashioned sayin' (when you stop to think about it) is an awful good way of runnin' things—runnin' the country, runnin' your business, runnin' your home.

It shore would make things almighty pleasant, wouldn't it? Good feelin' all around.

They tell me (and I believe it) that a whole lot of these big companies have been built up on that dope. Our folks are strong for it,—that's the reason I'm stringin' along with *Ever-Tytes*.

The Boss says, keep thinkin' and actin' that Golden Rool and you'll have a keen appertite,—you can pound your ear eight hours

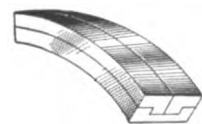
per night, and you get up every mornin' sayin'—Gee, this is a great old world. These here *Ever-Tyte* Piston Rings in a way are helpin' to make the Golden Rool fashionable, because they add a little to the faith of the guy usin' 'em.

The EVER TIGHT PISTON RING Co.

1609 KINGSLAND AVE.

AGAD-12-18

ST. LOUIS, MO.



RIGHT ANGLE
INTERLOCK



Would anyone dare-?

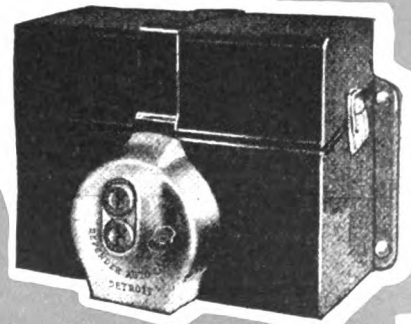
The DEFENDER AUTO LOCK gives the same sort of theft protection to the FORD as does the ferocious looking bulldog that stands guard in the yard to warn away night-prowlers. There is no automobile lock sold that gives as much satisfaction to your customers. And there is no lock that offers better business opportunities.

The DEFENDER AUTO LOCK operates against ignition by special grounding device, besides double locking both coils and switch. Guaranteed for the entire life of the car, and backed by a company with an international reputation for selling only the best.

Known as "the standard," and pronounced the best throughout the civilized world. May we quote you?

All special features fully covered by patents in U. S. and Can.

DEFENDER AUTO LOCK CO.
5th Floor Marquette Bldg. Detroit, Mich.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



"NORMA" PRECISION BALL BEARINGS (PATENTED)

As the success of an organization rests upon the capacity of the men comprising it, so does the success of a machine depend upon the integrity of its parts. To sacrifice quality for price in any part of a machine, is as fatal as to place an incapable man in an efficient organization. There can be no more short-sighted fallacy.

Day-in-and-day-out dependability has uniformly been the distinguishing characteristic of those high-grade ignition apparatus and lighting generators in which "NORMA" Precision Bearings have been the standard bearings. Their record is not one of days or months, but of years.

**Be Sure—See That Your
Electrical Accessories
Are "NORMA" Equipped.**

THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings



AMERICAN GARAGE & AUTO DEALER

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|--|----|
| Bankers and the Retail Automotive Trade..... | 18 |
| Stick to "Cash for Service" Plan..... | 18 |
| Those Who Help Shows Help Themselves..... | 18 |

GENERAL

| | |
|--|-------|
| Make This Year Your Best Year..... | 9 |
| Chicago's Show Is Only One Accessory Makers Recognize..... | 10-11 |
| A Chance for Jobbers and Makers..... | 10 |
| Omaha to Have Tractors; Trade Meets with Bankers..... | 11 |
| Cash for Service Plan Benefit for Customers..... | 11 |
| The "Wizard's" Advice..... | 11 |
| ACCESSORIES, by M. E. FABER..... | 12 |
| Running Board Carrier Useful in Many Ways..... | 12 |
| A-C Ford Hub Brakes Are Easily Installed..... | 12 |
| Victory Siren Whispers or Shrieks in Warning..... | 12-13 |
| Quick Sales Come from Showing Fire-Choke..... | 13 |
| Cassidy Firm to Sell Acheson-Gredag Lubricant..... | 13 |
| Inland Piston Ring Firm Moves into Larger Offices..... | 13 |
| Motor Trucks on the Farm Save Time and Make Money..... | 14-15 |
| Beat You to It..... | 15 |
| Page Presides at Meeting of Fulton Truck Dealers..... | 15 |
| Specialty Firm Moves..... | 15 |
| Make This Year Your Best Year..... | 16 |
| Is This Civilization?..... | 16 |
| Hurry with Your Sales Plan; Good One Comes from Minnesota..... | 17 |
| Fix Casings and Tubes NOW..... | 20 |
| New Company to Market Non-Lubricant Bearing..... | 20 |
| In the Truck and Trailer Field..... | 22 |
| Trucks Go About Business in Tropics or Near Arctic..... | 22 |
| Cooke Is Advertising Head for Denby Motor Trucks..... | 22 |
| Burgess Device Proves Virtue in Ride Over Rough Roads..... | 24 |
| Storm Firm's New Service of Light-Weight Pistons..... | 24 |
| C. B. Johnson to Market Red Star Timer for Fords..... | 24 |
| Tractors and Farm Lighting..... | 26 |
| Electric Service Concerns Organize an Association..... | 26 |
| Patented Process to Fix Scored Cylinders Brings Much Business..... | 28 |
| Wallace C. Hood Becomes a Paige Car Distributor..... | 28 |
| Baling Press Brings Cash from Waste Paper Stock..... | 28 |
| Captain Harry W. Ford..... | 34 |
| Road Drainage Discussed in Government Bulletin..... | 34 |
| Lt. E. Ralph Estep..... | 34 |
| Calculagraph Prevents Time Disputes on Jobs..... | 40 |
| A Radical Departure in Roller Bearings..... | 40 |

DEPARTMENTS

| | |
|--|-------|
| How to Make the Shop Pay..... | 30-40 |
| Welding, Cutting and Brazing..... | 32 |
| Mechanical and Engineering Problems..... | 36 |
| Accessories and Garage Equipment..... | 38-40 |
| Buyers' Reference..... | 52 |
| Index to Advertisers..... | 51 |

American Garage & Auto Dealer, Inc.

General Offices:

116 S. MICHIGAN AVENUE
CHICAGO, ILL.

J. R. HASTIE, President

H. D. FARGO, Vice President

E. C. HOLE, Vice President

E. T. CLISSOLD, Vice President

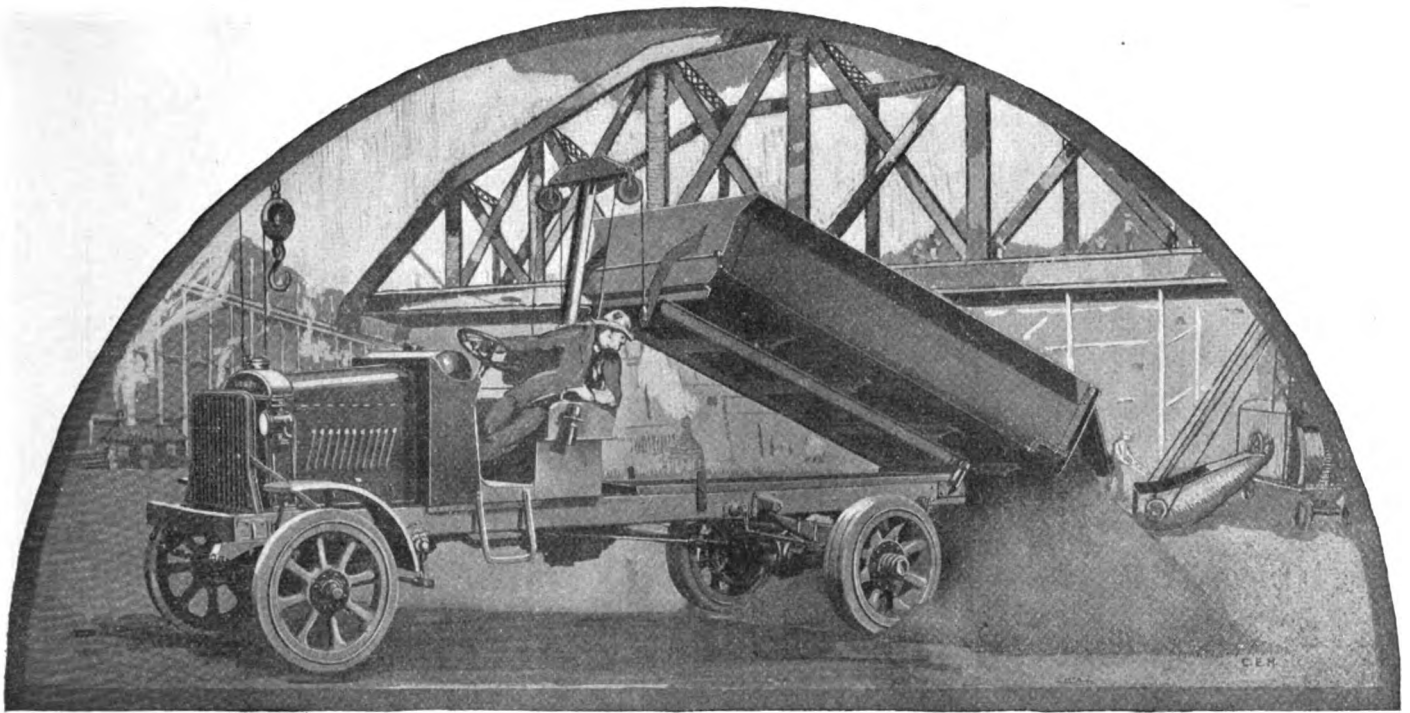
J. C. KELSEY, Secretary and Treasurer

EDITORIAL

R. B. JOHNSTON, Editor

Entered as second-class matter, March 1, 1916, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

Subscription Per Annum (Postage Paid) \$1.00. Advertising Rates on Request.



DENBY

MOTOR TRUCKS

You'll Like This New Denby

This 3½ Ton Denby gives a new meaning to the term *Heavy Duty*—sets a new standard of power, capacity for work under any conditions, and economy of operation and maintenance.

While the model is a new one, the design is not, for it is a companion truck to the 5-Tonner that has proved so successful in the heaviest service. It was brought out in response to an insistent demand from users and dealers, for a truck of lighter capacity, but the same quality and capability as the 5-Ton Denby.

We have held this model back from production for a year, that there might be no question concerning any detail of design. Model cars were sent out over the country, testing its hill climbing, its ability to negotiate *any* roads, under the most adverse conditions.

Two of these model cars spent the summer working in eastern Oregon hauling wheat over

sandy, dusty roads. All the tests were made under actual service conditions with inexperienced drivers.

Only when we had proved these trucks under the worst of conditions and were absolutely certain they were as near perfect as human skill could make them, did we O. K. them for production.

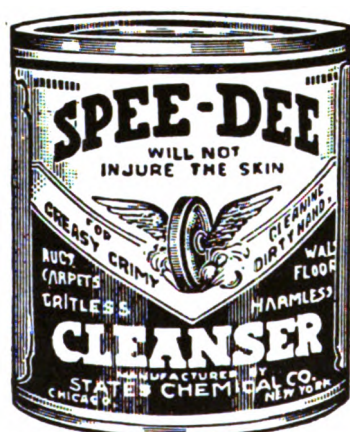
The Denby line is now complete. With trucks of 1, 2, 2½, 3½ and 5 Tons, there is a model for each trucking need

Denby Motor Truck Company - - - Detroit

**Cleans
everything**



**Injures
nothing**



SPEE-DEE

**Wash your Automobile Tops,
Seat Covers, Celluloid Curtains,
Fenders, Wheels, Trucks—anything**

without damaging the surfaces you are cleaning—
SPEE-DEE is harmless—does not scratch. Contains no
acid, lye, or grit, but is smooth and soft. Works quickly
and thoroughly, and with the least effort.

DEALERS:

Every SPEE-DEE user is a constant user and the demand for it is consistent and ever growing. Our attractive posters, which identify you as a SPEE-DEE dealer will keep your stock moving.

Cleans greasy, *grimy* hands
with or without water

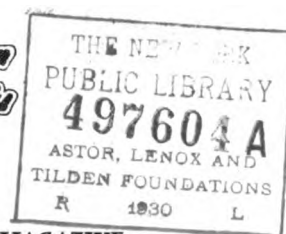
This feature makes SPEE-DEE especially valuable
in cold weather.

You will find SPEE-DEE mighty useful in your garage,
as well as a profitable seller. A trial order will convince
you. Prices and particulars on request.

STATES CHEMICAL CO.
680 W. Austin Ave. CHICAGO, ILL.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

AMERICAN GARAGE & AUTO DEALER



Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL

Vol. X. No. 1

CHICAGO

January, 1919

Make This Year Your Best Year

See Page 16



Chicago's Show Is Only One Accessory Makers Recognize

Chicago dealers will have the credit for handling the biggest automobile show this year. One of the best moves made by the officials of the Chicago Automobile Trade Association was accepting the offer of S. A. Miles, who has always conducted the big western national exhibitions, to act as manager for the show to be held in the Coliseum and First Regiment Armory, January 25 to February 6.

Passenger cars will be exhibited from January 25 to February 1, and trucks will be displayed from February 3 to 6, inclusive.

Show Time Meetings

Record attendance is expected at the annual meeting of the National Automobile Dealers Association to be held in Chicago, Tuesday and Wednesday, January 28 and 29, during the progress of the automobile show. The meeting will be held at the La Salle Hotel, and a number of prominent men will make addresses on live trade subjects.

The annual meeting of the Motor & Accessory Manufacturers Association will be held at the Congress Hotel, Chicago, Wednesday, January 29.

Largely through the tactful efforts of Mr. Miles, the Chicago show will have the distinction of being the only one in which members of the Motor and Accessory Manufacturers' Association will exhibit.

As was announced in this journal last month, the show to be run by the New York dealers will be held in Madison Square Garden, but owing to demands for space the 69th Regiment Armory, which is a short block away from the back door of Madison Square Garden, will also be used. The New York show will run from February 1 to 15, passenger cars being shown from February 1 to 8, and trucks from February 10 to 15. One of the features of the New York show will be an eastern division meeting of members of the National Automobile Dealers' Association, February 5, a week after the close of the annual meeting of the organization in Chicago.

The Coliseum Annex and First Regiment Armory will be decked in purple and gold. A vast canvas top-piece,

measuring 300 by 240 feet, will entirely cover the Coliseum ceiling. It will have scroll work of purple and gold. At one upper end of the Coliseum will be a brilliant transparency depicting the Goddess of Peace receiving Industry, and on the other end another Goddess holding out an automobile to the world.

About the upper sides of the vast building will be great sunbursts having in the foreground outlines of the various types of the automobile. Between the sunbursts will stand the insignia of the Allied nations on shields, and the flags will also be featured, as the Chicago Automobile Show this winter reflects peace, victory and optimism.

The passenger car exhibit has the following firms entered:

At the Coliseum: Oakland, Buick, Studebaker, Briscoe, Oldsmobile, Overland, Dodge, Mercer, National, Hudson, Cadillac, Hupmobile, Marmon, Reo, Paige, Franklin, Nash, Chandler, Packard, Pierce-Arrow, Haynes, Chevrolet, Maxwell, Chalmers, Grant, Velle, Premier, Winton, Scripps-Booth, Kissel Kar, Cole, Dort, Stephens, Moline, Stearns, Westcott, Mitchell and Lexington.

At the Coliseum Annex: Holmes, Stutz, Liberty, Elgin, Jordan, Paterson, Essex and Daniels.

At the First Regiment Armory: Locomobile, Peerless, Standard Eight, McFarlan, Biddle, Davis, Case, King, Elcar, Apperson, Cunningham, Roamer, Dorris, Auburn, Allen, Saxon, Rue Motor Company of Chicago, which handles the Ford cars, Owen Magnetic, Baker R. & L., Milburn Electric and Detroit Electric, Malbohm and Fiat.

For the commercial car exhibit in the Coliseum and Annex the following are nominated: Garford, G. M. C., Diamond T, Federal, Indiana, Reo, Clydeedale, Bethlehem, Republic, Dearborn, Pierce-Arrow, Nash, Velle, Four-Wheel Drive, Chevrolet, Lapeer, Dodge, Maxwell, Locomobile, Autocar, Master, Service, Paige, Kissel, Walker, Brockway, Acme, Panhard, Sanford, Graham, Sandow, Dorris, Oneida, Mutual, Gary, Patriot, Couple Gear, Winslow, Truxton, Fulton, Ford, Available and Tower.

PASSENGER SECTION—ACCESSORIES.

Ahlberg Bearing Co., Alemite Die Casting & Mfg. Co., Amazon Rubber Co., American Bronze Corp., Anderson Electric Specialty Co., Anderson Forge & Machine Co., Arrow Grip Mfg. Co., Auto Cape Top Co., Inc., Auto Indicator Co., Auto Parts Co. of America, Bailey Drake Co., Barnes & Miller, Becker Bros., Bell Tire & Rubber Co., Black & Decker Mfg. Co., Bosch Magneto Co., Buda Co., Buell Mfg. Co., Buffalo Specialty Co., Bovey Auto Heater Mfg. Co., Carlisle Tire & Rubber Co., Chaileron Co., Champion Ignition Co., Champion Mfg. Co., Chicago Coach & Carriage Co., Clark Equipment Co., Cochran Pipe Wrench Mfg. Co., Cole Storage Battery Co., Corbin Screw Corp., Dafeo Eustice Co., Detroit Pressed Steel Co., Jos. Dixon Crucible Co., Eastern Rubber Co., Eclipse Machine Co., Eisenmann Magneto Co., Electric Storage Battery Co., Empire Mfg. Co., Essenkey Products Co., Flash Sales Corp.

Gabriel Mfg. Co., Gates Co., Globe Mfg. Co., Graff Mfg. Co., R. J. Grant & Sons, Gray & Davis, Inc., Gray-Heath Co., Edw. V. Hartford, Inc., Robert H. Hassler, Inc., Helmer Vehicle Works, Hercules Buggy Co., Holland Brass Works, Ideal Tire & Rubber Co., Imperial Brass Mfg. Co., Inland Machine Works, Jefferson Elec. Mfg. Co., Jessop & Thompson, Johnson Auto Lock Co., Wm. R. Johnston Mfg. Co., Kales Stamping Co., Kent, Atwater Mfg. Works, Lane Bros., Lipman Air Appliance Co., Beloit, Wisc. Marmon Chicago Co., Marvel Machinery Co., McCord Mfg. Co., Mechanical Belt Co., Mitchell Bynon Co., Monarch Auto Lock Co., Morand Bros., Moto-Meter Co., Inc., Motor & Accessory Manufacturers Assn., 33 W. 42nd St., New York City, National Carbon Co., National Mileometer Co., National Refining Co., National Wire Wheel Works, New Era Spring & Specialty Co., Parry Mfg. Co., Parker Collapsible Rim Corp., Perfex Radiator Co., Wm. E. Pratt Mfg. Co., Radium Dial Co.

A. Schrader's Son, Inc., Simms Magneto Co., Simplicity Wheel Co., Simoniz Co., Sparks-Withington Co., Spitzdorf Electrical Co., Stahl Rectifier Co., Standard Motor Parts Co., Standox Mfg. Corp., Stewart Warner Speedometer Corp., Stoip Elec. Specialty Co., Stromberg Motor Devices Co., Taft Pierce Mfg. Co., Titeflex Motor Hose Corp., J. H. Tonneau Shield Co., Inc., Trindl Machine Works, Triple Action Spring Co., Tuthill Spring Co., Twin Fire Spark Plug Co.

U. S. Auto Gear Shift Co., U. S. Auto Supply Co., Vacuum Oil Co., Van Sicklen Co., Vesta Accumulator Co., F. W. Wakefield Brass Co., Wales-Adamson Co., Waltham Watch Co., Warner-Patterson Co., Waukesha Motor Co., Weaver Mfg. Co., Wee Specialty Co., West Steel Casting Co., Wheeler-Schebler Carburetor Co., Inc., Willard Storage Battery Co., J. H. Williams Co., Wire Wheel Corp. of America.

A Chance for Jobbers and Makers

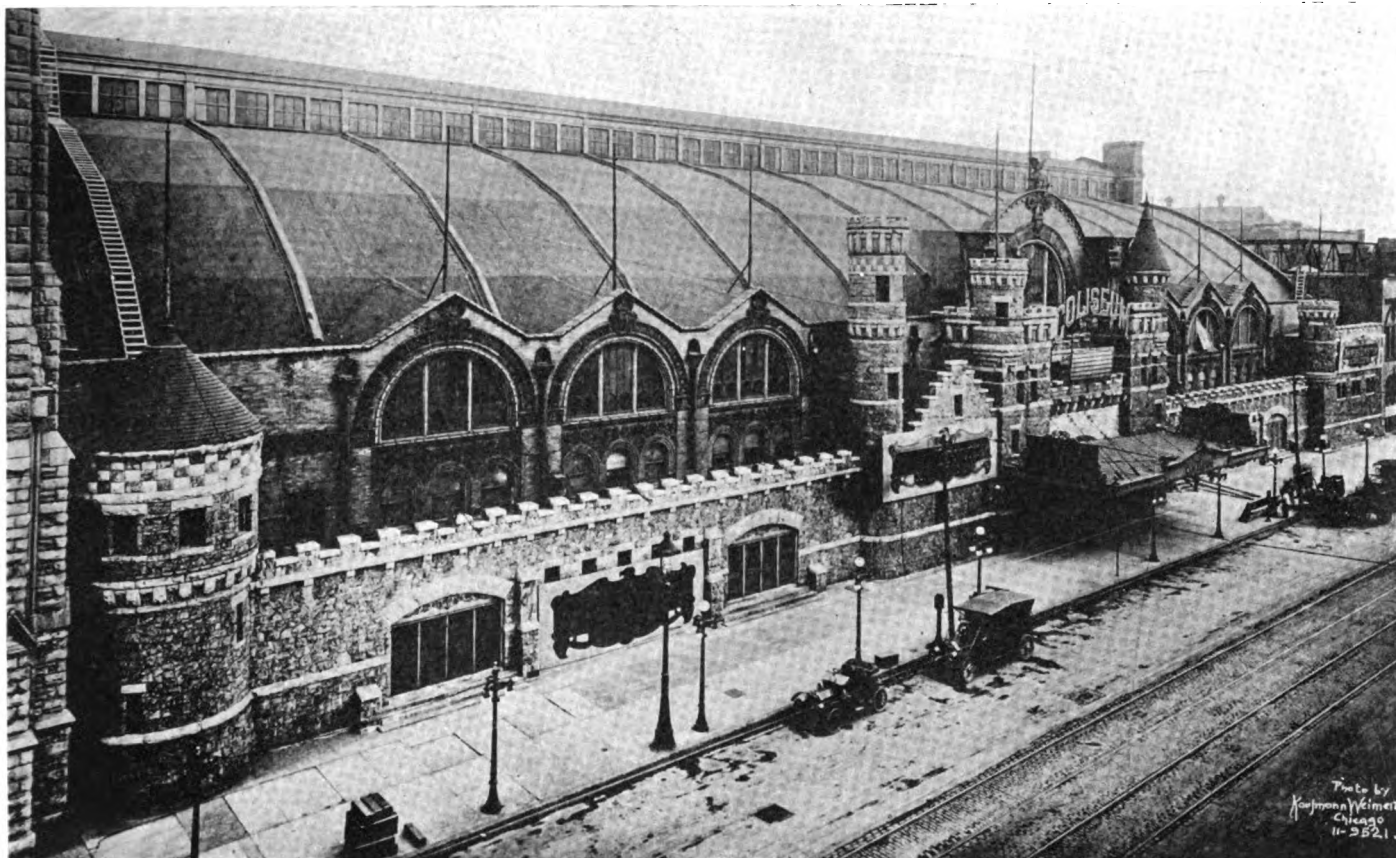
Altoona, Iowa, Jan. 6, 1919.

American Garage & Auto Dealer:

Please advise me on a line of small tools, for general purpose, automobile and farm use, to be handled in connection with garage and repair shop.

Yours truly,

C. C. LANG.



Coliseum Where Chicago Dealers Will Hold Show

COMMERCIAL SECTION—ACCESSORIES.

Ahlberg Bearing Co., Alemite Die Casting & Mfg. Co., American Bronze Corp., American Chain Co., Inc., American Taximeter Co., Anderson Forge & Machine Co., Arrow Grip Mfg. Co., Buda Co., Budd Wheel Corp., Buell Mfg. Co., Challoner Co., Champion Ignition Co., Chicago Mfg. Co., Clark Equipment Co., Corbin Screw Corp., Jos. Dixon Crucible Co., Electric Storage Battery Co., Robert H. Hassler, Inc.

Inland Machine Works, Morand Bros., Motor & Accessory Manufacturers' Assn., National Refining Co., Pantasote Co., Parry Mfg. Co., William E. Pratt Mfg. Co., Rowe, Calk & Chain Co., Sewell Cushion Wheel Co., Sherman & Ellis, Inc., Simms Magneto Co., Sparks-Withington Co., Splittorf Electrical Co., Stromberg Motor Devices Co., Taft Pierce Mfg. Co., Titeflex Motor Hose Corp., Trindle Machine Works, Tuthill Spring Co., Vesta Accumulator Co., West Steel Casting Co., Wheeler-Schebler Carburetor Co., J. H. Williams Co.

Omaha to Have Tractors; Trade Meets With Bankers

Plans are being made by the show committee of the Omaha Automobile Trade Association to include tractors and trucks in their annual exhibition to be held March 10 to 15 inclusive. The affair will be staged in the Omaha Auditorium, and will be under the management of Clarke G. Powell, who is secretary of the Association. Mr. Clarke predicts that the forthcoming function, which will be Omaha's fourteenth annual automobile show, will be the biggest exhibition of the kind ever held in that city.

Early this month the Omaha organization held a get-together meeting for the dealers in the Omaha territory at the Omaha Chamber of Commerce. The tradesmen invited were urged to bring their bankers with them to the gathering. The invitations sent out by the trade association asked each invited guest, in the event that he was unable to obtain his banker's acceptance, to give his name and address to the Association in order that a personal invitation might be sent direct to him.

Invitations to make addresses were accepted by former United States Senator Lafayette Young, of Des Moines, Iowa; President C. W. Nash, of the Nash Motors Co.; President R. H. Collins of the Cadillac Motor Car Co., and Walter W. Head, vice-president of the Omaha National Bank.

Cash for Service Plan Benefit for Customers

Through the recommendation of the War Economy Board, numbers of dealers have adopted the "cash" basis for service department work. The results of this radical change are interesting not only because of the manner in which the change was received by patrons, but also because of the positive improvement in service and economy in cost.

Ralph Shaffer, vice president of the American Automobile Company of Tacoma, one of the prominent distributors of the Liberty Six on the Pacific Coast, says: "In adopting the cash-for-service plan, we dealt with a subject that had been discussed for months. For many years the American Automobile Company has operated on a good credit basis and we

had a tremendous number of cars sold all over the state of Washington to firms that had established credit with our house. Firms and individuals were accustomed to write or telephone for parts and have them charged.

"From a financial point of view, our customers have benefited again. They are sharing the saving effected by the elimination of bad accounts, bookkeeping, collecting and overhead which were necessary under the old credit plan."

The "Wizard's" Advice

"The only thing needed to insure a year of great prosperity is a determination on the part of every business man, big or little, to go ahead with absolute confidence in the future."

"Every business man should speed up his sales organization. The salesmen of this country can do more than any one else to keep the wheels of industry turning at full speed. The salesman had to take a back seat during the war, but his time has now come. Give him a chance."

—Thomas A. Edison.

ACCES\$SORIES

BY M. E. FABER.

Just because an advertisement in your trade paper has told its story to you it doesn't necessarily follow that it has done its whole duty. Maybe some of your customers who need the article advertised don't even know that the article even exists. The average car owner is always looking for accessories that will make it easier or cheaper, depending on his nature, to drive his car.

When a manufacturer pays good hard money for a full page advertisement in an automobile publication he usually employs an expert to tell his story for him. The expert studies the class of people who are most likely to buy the goods so that when he has his story written it brings out the merits of the article in a way that produces sales or loses the advertising man his job.

Probably the advertisement that interests you will interest your customers too. If that advertisement can be made to create the desire to buy in the mind of a customer at the very time he is in the place where he CAN buy—in your accessory department—it means money in your pocket as well as in the manufacturer's.

One farsighted accessory merchant raised himself out of the class of dealers who only sell the accessories

that people come in and ask for because they absolutely have to have them in a manner that anyone can make use of. He went to the ten cent store and bought half a dozen cheap picture frames that were approximately ten by twelve inches. Wire easels were attached to the backs of these frames so that they would stand upright wherever they were placed.

At frequent intervals this man goes through his trade papers and picks out a few of the advertisements that will look good to his customers and into the frames they go. They are set in the show-window, on the counter, or hung on the wall. You can hardly go into his place of business for a minute without having one or more of them staring you in the face.

The cash register jingles oftener than it used to. People read, ask questions, and buy more accessories. Many sales are made that otherwise would be lost. Articles are sold that the customer never thought of buying when he entered the store and which he would never have seen in their hiding places on the shelf or in the showcase. The customer's mind is focused on the article until he gets its whole story better than a salesman could tell it.

MAKE A NOTE TO TRY THIS TODAY—AND KEEP IT UP.

RUNNING BOARD CARRIER USEFUL IN MANY WAYS

While Ekern's running board luggage carrier was especially designed for farmers to enable them to carry cream and eggs to market, the carrier can be used for many other purposes. This device does away with the necessity of putting bundles of various kinds in a tonneau where they are likely to be stepped on and damaged.



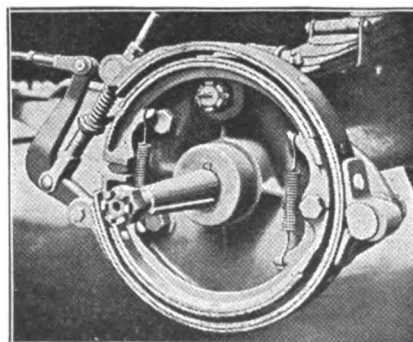
The carrier can be clamped to or taken off the running board in less than a minute by loosening two burrs underneath the running board. It is 28 inches long, 14 inches wide and 9½ inches deep. Straps are pro-

vided to hold the contents of the carrier firmly in place.

The carrier weighs 18 pounds and is finished in black enamel. Dealers who wish trade prices and further particulars can obtain them by writing to the H. G. Paro Co., 1410 S. Michigan Ave., Chicago, and mentioning the AMERICAN GARAGE & AUTO DEALER.

A-C FORD HUB BRAKES ARE EASILY INSTALLED

The maker of the A-C external hub brakes for Ford cars claims that they do away with from 75 to 90 per cent of trans-



mission and rear axle trouble. This brake bracket and band is attached to the rear axle housing, connected by cable and equalizer using same brake pedal, and does not interfere with the regular emergency brake. The following advantages are claimed for the A-C brakes:

They deliver the braking power direct to the rear wheel, taking all the strain off the rear axle shaft, gears, keys and transmission bearings. It is claimed that they will prevent skidding, and that their use permits stopping to be made without noise. Nothing is taken off a Ford to apply them, and they can be installed with a wrench.

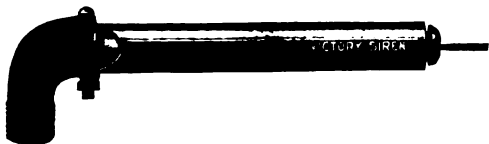
Readers who wish full particulars and trade prices can obtain them from the A-C Mfg. Company, Inc., Grand and Oakley avenues, Chicago, Ill., by mentioning the AMERICAN GARAGE & AUTO DEALER.

VICTORY SIREN WHISPERS OR SHRIEKS IN WARNING

A distinctive and unique warning signal is the clever little device coming into wide favor just now under the name "Victory Siren." It attaches to the exhaust manifold of any car in a few minutes, is controlled from the dash or steering column,

and sings "like a mocking-bird." The charming, musical warbles and trills it produces are quite unlike any other sort of warning device—but marvelously efficient for its purpose.

The perfect control afforded enables the driver to "whisper" a gentle and pleasant warning in quiet neighborhoods, or to shriek a shrill command in the midst of busy traffic where instant action is imperative. A thousand tones, up and down the scale, are given—but always unmistakable, clear and compelling.



The device is sold through the jobbing trade and by practically all dealers. It is beautifully finished in polished brass and is manufactured by the Inter-State Tool & Mfg. Co., St. Louis, Mo., who will send full details and trade prices to dealers who mention the AMERICAN GARAGE & AUTO DEALER when writing.

QUICK SALES COME FROM SHOWING FIRE-CHOKE

Consider the \$10 bill that is occasionally dropped in a crowded street. It lies there in the dirt. A thousand people walk over it. Then at last someone stops and picks it up.

Why did the first man who passed miss his opportunity to get an easy \$10?

Because he was thinking of other things. He did not happen to have in mind that \$10 bills sometimes lie underfoot and thus he missed his chance.

Now the object of this little article is not to urge people to go around with their eyes on the ground. You can make a larger and surer profit by keeping an eye on the pages of your trade paper.

In each number of THE AMERICAN GARAGE & AUTO DEALER are mentioned accessories which every dealer who reads could handle with profit. They have merit, they meet a need, otherwise they would not be advertised; yet many pass them over until the wise man looks into their possibilities and makes a profit.

This fact was forcefully brought to mind in connection with a new product recently put on the market, Fire-Choke, a dry chemical fire annihilator sold by The Flexlume Sign Co., Buffalo, N. Y., whose Oplex signs are widely known in the automobile trade. THE AMERICAN GARAGE & AUTO DEALER was the first automobile journal selected to carry Fire-Choke advertising because of its splendid dealer circulation.

Now a large number of dealers have answered Fire-Choke advertising and taken it on. They are finding it profitable. But the surprising part of it is that every dealer has not looked into the possibilities of this new chemical. Like the men who

passed over the \$10 bill they just didn't expect to find anything there.

If they had taken the trouble to dig deeply they would have been impressed with the following facts:

That Fire-Choke is a "good seller."

That its retail price of \$3.50 and \$5.00 as compared with the higher priced mechanical extinguishers, which its makers claim it surpasses in efficiency, is very attractive to the buying public.

That it is backed by a free sampling plan which is causing a growing demand.

That it provides a spectacular demonstrating feature to interest customers. Some dealers find it is time well spent to demonstrate it often in front of their stores. The way they do this is to pour gasoline over the motor of a car, light it and extinguish the flames with a handful of Fire-Choke. This demonstration always draws a crowd and usually results in sales. Just as an advertising "stunt" it is well worth the time, and the company supplies the chemical for these demonstrations.

That the special offer the company is making in order to get quick distribution is most attractive.

Of course it isn't too late to get aboard with Fire-Choke yet. You can get full information and a free test package of the chemical by writing to the Flexlume Sign Co., Buffalo, N. Y., but the point is that many dealers are overlooking similar good chances every day.

They are just like the people who unconsciously walk over \$10 bills.

The man who is always finding fault with his job may not realize what a scream he is. In reality he is finding fault with himself. A poor workman always quarrels with his tools, and an inefficient individual is a constant manufacturer of excuses.



This Fire Is From a Large Quantity of Paint Drippings and Gasolene. One Handful of Fire-Choke Put it Out

Cassidy Firm to Sell Acheson Gredag Lubricant

The Acheson Graphite Company of Niagara Falls announced at the jobbers' convention in Chicago recently that negotiations have been completed whereby Edward A. Cassidy Company is to act as the sales department for Gredag.

Gredag is the lubricant perfected by Dr. E. G. Acheson, one of the noted scientists of this country on lubrication. It is a blending of the highest quality grease with exactly the right proportion of 99.9% pure Acheson-Graphite (not mined), and is manufactured by the special Acheson formulas and process.

The high quality of Gredag is evidenced by the fact that the makers of more than 30 leading automobiles, trucks, motorcycles and tractors have made Gredag their standard lubricant, and that it is a recognized quality lubricant in the industrial field.

Plans are now under way and will shortly be executed for a progressive and far-reaching sales and advertising campaign, national in scope. The splendid reputation made by Gredag in the industrial world, coupled with the Cassidy merchandising policy, offers a remarkable opportunity to the automobile trade.

Inland Piston Ring Firm Moves into Larger Offices

Need for more room has forced the Inland Piston Ring Co. to move its general offices from its factory at St. Louis. The new quarters are located at 1635 Louis street, in the St. Louis retail automobile district.

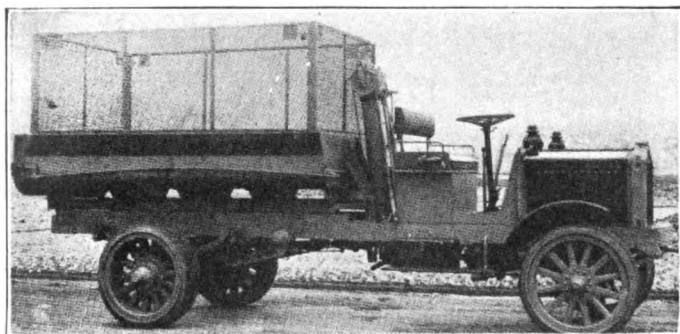
The Inland folks have taken the whole lower floor of the new Advertising Building for their offices. A convention of the Inland sales force was held there early this month.

Motor Trucks on the Farm

Save Time and Make Money

While enterprising farmers were adopting the motor truck quite rapidly before the war, the shortage of labor caused by the taking away of so many men for the Army and Navy helped convince many other farmers that trucks were necessary for their business.

One of the greatest advantages of trucks in the service of farmers is that they do the work so much more quickly than it is possible to perform the same task with horses. One striking instance of this is furnished by C. D. Brannan, Butcher Ranch, California, who does all his hauling between his farm and Auburn, California, over 15 miles of mountain road with a one and one-half ton Federal motor truck. He makes the round trip in six hours with a capacity load. When Mr. Brannan did his hauling with horses it required two days with a one-ton load, because there were some very heavy grades between his farm and Auburn.



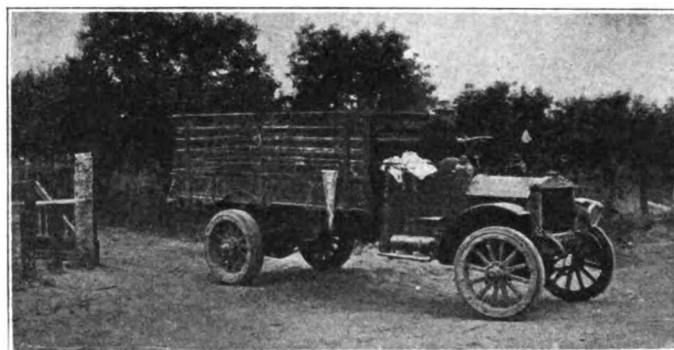
Special Body for Live Stock

Before motor trucks came into use farmers who raised produce were forced to load their wagons the day before, and very often drive all night, in order to be at the market place early in the morning. Now, however, the produce raiser can get up about his regular hours in the morning, load his motor truck and drive to his market, arriving there about the same time he did when starting the night before with horses. One man who does this is J. L. Campbell, who really conducts a sort of return-load rural motor express line of his own. He



C. D. Brannan's Federal

hauls his produce to Newcastle in a two-ton Federal and brings back freight for himself and his neighbors.



Produce Carrying Truck

One advantage of using motor trucks instead of horses in hauling loads from orchards is that motor trucks have not been known to reach around and eat the choicest fruits from the trees as has sometimes been done by horses. The San Diego fruit company uses a one and one-half ton Federal for hauling crops from orchards and has been very successful with it.

While rice is not considered of as much importance in this country as wheat, corn and other grains, it is bringing millions of dollars to California growers. Last year many acres were devoted to growing rice in California and half of the crop raised in that state was gathered from Butte, Glenn, Tehama, Colusa and Yolo counties. Rice is raised in damp, marshy ground, and it is a difficult task for trucks, either motor driven or horse-drawn, to pull capacity loads from these fields.



Loading Rice

But W. J. Martin, of Yolo County, drives his three and one-half ton Federal into the fields, gets a capacity load and drives out without delay. Mr. Martin hauls his rice from 6 to 15 miles one way. He said that he was more than pleased with the truck, as it was giving excellent service, and he was making nearly \$80.00 per day on hauling the rice.

The number of uses to which a motor truck can be put is one of its greatest advantages for use on farms. The manager of the Beechwood Farms at Sharpsburg, Pa., has fixed up a three and one-half ton Federal in such a way that it can be used for several purposes. This truck has a regular dumping body, operated by a hydraulic hoist, so that loads that can be dumped may



Loading with Peach Boxes

be quickly discharged. This provides a means for quick unloading of potatoes or ears of corn or anything else that would not be bruised by being dumped at once. This truck has an extra body or top constructed of steel uprights with wire netting sides. This top is mounted on a regular platform body, when it is desired to carry live stock. The same wire top is used when it is necessary to carry big loads of bulky products or freight.



Loading Truck in Orchard

Page Presides at Meeting of Fulton Truck Dealers

Several score distributors and dealers of the Fulton Motor Truck Company met at Farmingdale, Long Island, Wednesday and Thursday, January 8 and 9. This was the first convention of the Fulton company, and optimism reigned supreme throughout the gathering, which was presided over by Carl H. Page, of the Fulton Motor Truck Company of New York, and addressed by William Fulton Melhuish, president, and other officials of the company.

Elaborate arrangements had been made for the convention by W. Irving Fickling and H. T. Melhuish, advertising manager of the company. The visitors had their headquarters in New York at the Waldorf-Astoria Hotel, and each morning made the trip to the factory at Farmingdale, 31 miles from New York, in a special train,

with a diner. Meetings were held in a beautifully decorated room at the plant.

Among the dealers and distributors who inspected the plant and product, there was general comment regarding the growth of the huge plant which, started August 1, 1916, in war time, today covers many acres on a 43-acre tract owned by the company, and which comprises more than a score of modern buildings of saw-tooth construction. Plans for enlargement of the factory were made known, and, with the outlook for the future so bright, President Melhuish promised the distributors an output daily of 30 trucks prior to increasing plant.

Orders for thousands of trucks were placed, and specifications for the immediate future covering two months brought the announcement that there would be scheduled at once a vast increase in production. President Melhuish outlined a brief history of the company, and gave his

Motor trucks are especially valuable for carrying fruit from orchards to refrigerator cars because the time required is so much less than would be the case if horses supplied the motive power. Trucks are also able to carry larger loads than horse drawn vehicles, and this is also a great thing in their favor. There is a two-ton Federal that is used by the Sochelle Peach ranch, North Yakima, Washington, that hauls peaches from the packing shed in the orchard to the refrigerator cars, and it carries 406 cases, each weighing 22 lbs.

BEAT YOU TO IT

(With apologies to K. C. B.)

I WENT into a garage
TO GET the old "bus"
TINKERED and
STARTED the regular hunt
FOR ONE of those
BOTTLE-SHAPED boys,
TO SEE if I could
TEAR ONE away from a
STICKY PATCH, or get one
TO GRUNT at me
FROM over a lathe,
WITHOUT LOOKING up.
AND FROM SOMEWHERE
A VOICE was calling—
"BE RIGHT with you,
IN A MINUTE";
A CHEERFUL noise!
AND THEN I came to
AND SAW that it was
COMING OUT of a
SMUDGY FACE, which was
UNDER A CAR, and looking
OVER THE top of a
SQUARE HOLE in the floor.
AND THE face was nice and
SMILEY, AND came out of
THE TRENCH, and he wrote
ON A TAG what I wanted
AND SAID it would be done
TOMORROW—AND it
WAS, b'gee!

AND I said, "Gimme a
PIECE of clean waste,"
AND HE DID. And I wiped
OFF the wheel, and
THE DOO-DABS, and the
PLACE WHERE my elbow
GOES WHEN I drive,
AND THE cushion
(WHERE THEY leave the
GREASE FROM the
BASEMENT of their
COVERALLS), and the
WASTE KEPT right on
KEEPING CLEAN, and I
LOOKED AT the man and he
WINKED AT me, and said:
"BEAT YOU to it,"
AND I asked, "Where'd
YOU GET your dope?" and
HE SAID, "He'd read about
THE OLD darky on the
TALLAHASSEE RIVER
WHO ALWAYS got the most
FISH, AND had a
DOUBLE-ENDED fish net
AND WHO said, 'Massa,
I COTCHES 'em a-comin',
AN' I cotches 'em a-gwine.'"
Respectfully submitted by
WM. E. ELDRIDGE,
S. F. Branch Floor Salesman.

From the "Accelerator," house organ of Weinstock-Nichols Co., San Francisco.

The little story quoted above was sent to the editor by M. E. Faber, advertising manager of the C. A. Shaler Co., with the comment: "Almost too true to be good."

reasons for locating on Long Island rather than at the heart of the automotive industries in the Middle West. In his address he likened the motor truck industry to the railroads, which he said had never paid dividends on the passenger car business. Mr. Melhuish said that the passenger car manufacturing industry in the automotive field was small as compared to what the motor truck industry would be in the future. He dwelt upon the repeat orders from large companies of the country who are users of trucks. Many of these companies have reordered eight, nine and even more times.

CINCINNATI SPECIALTY MOVES.

The Cincinnati Auto Specialty Co., Cincinnati, Ohio, announces its removal to 312-14 Main St. In its new headquarters, the company will have 20,000 square feet of manufacturing space.

Make *THIS* Year Your *BEST* Year

With factories producing automotive goods released from their production of war materials of different kinds, automotive merchants who will plan now to sell the things they can get can **MAKE THIS YEAR THEIR BEST YEAR** so far as profits are concerned.

But in order to do this they must at once find out definitely how the manufacturers, distributors and jobbers from whom they buy their goods will be able to fill orders. So far as passenger cars are concerned it is not likely that the majority of the manufacturers will be able to bring their production up to the old time figures for months.

In some cases big car manufacturers hope to be making as many cars as formerly in three months, while others do not expect to get their plants going at full capacity for six months.

Automotive tradesmen who sell passenger cars should therefore make fairly certain how many cars they will be able to get during the next few months, and the probable dates when these cars will be shipped from the factories or be available from a distributor. Then the dealer will be properly fortified to tell his prospective customers just how many cars he can get, and when he expects to be able to get them. This information should enable him to close many orders in the next month or six weeks from customers who otherwise might wait until warmer weather, when he would not be able to get cars to deliver to them.

Truck Makers in Good Position.

So far as motor truck makers are concerned the majority of them are in a better position to make deliveries than the passenger car producers. Most of the truck factories continued to turn out nearly as many trucks during war time as they had done previously. They would have kept on making trucks if the war had continued, though in that case the vehicles would have been used for various war purposes.

But even the motor truck manufacturers expect that there will be a much greater demand for months to come than they will be able to fill and so it will be a good plan for each dealer to find out how many trucks he can expect to get and when. If this plan is followed out it will prevent disappointment and save the dealer from putting in time and expense getting orders that cannot be filled.

Those automotive tradesmen who are handling truck makers and trailers should vigorously follow up their prospects, for sellers of these vehicles are not likely to be disappointed in getting deliveries as the makers are not expected to have much trouble obtaining materials.

Tractors Help Sell Cars.

The makers of tractors and farm electric plants are reported to be in a strong position so far as materials

go. It will be very good business for automotive merchants to push these lines, especially because sales of tractors and farm electric plants will bring them into friendly relations with prosperous farmers who are always good prospects for passenger cars and trucks.

One of the plainest duties of the automotive tradesmen during the next few months is to push the sale of tires and accessories. It is certain that many cars that were laid up for part or all of the time during the war period will soon be put into use again and many of these vehicles will need new tires. A good many owners who really should have new tires or spare tires did not purchase them during the war period because they were buying Liberty Bonds or because they felt it a patriotic duty not to get any new tires as so many were necessary for the use of the Army.

The certain shortage of new passenger cars is bound to help the sale of accessories. Owners of cars who must be content to use their old vehicles, because no new ones are to be had, will readily buy accessories to make the operation of their cars easier and more comfortable. Shock absorbers and other spring devices, engine primers and car heaters, are a few of the accessories that should find ready sale during the next few months if the dealers will bring the merits of these devices to the attention of buyers.

Here's a dandy motto to paste in the top of your hat:
"Greater business efficiency and a more marked degree
of success through personal improvement."

IS THIS CIVILIZATION?

According to one of our friends who represents a well-known jobbing house, a certain dealer has found a new conservation scheme. It appears that this dealer had recently taken on a line of well-known accessories, the manufacturers of which are particularly generous with sales helps.

Among other display material were several steel signs whose cost may have been a dollar apiece but whose value could be computed only on the basis of the thousands of dollars worth of merchandise they were selling for dealers who made them work.

And here's the way this dealer used them. His roof leaked, so he cut the signs into strips and used them for patches. **SOME CONSERVATION.** Dollars wasted to save pennies.

What becomes of the advertising matter that's ready to sell your accessories?

Hurry with Your Sales Plans; Good One Comes from Minnesota

One of the sales plans entered for our Sales Idea Contest is given below. It comes from Charles Olive of Willmar, Minn., and has the great virtue of having proved to be successful in increasing the profits of the concern that used it.

We want to hear from other readers who know of successful sales plans or merchandising ideas that have made money for automotive tradesmen. We are interested in these ideas, whether they were advertising plans in newspapers, direct-by-mail circular campaigns, selling goods or service by telephone, or through personal solicitation. In fact any method by which profits were increased.

The first prize will be \$25.00, the second prize \$15.00, and the third prize \$10.00. The contest is open to any of our readers, and will close March 1, but we hope that tradesmen who wish to enter the contest will send in their articles at once. The winners' names will be announced in our April number.

BY CHARLES OLIVE.

The manager of a popular garage in a Minnesota country town of six thousand population made a most remarkable success last summer selling automobiles. It was rather late in the spring when he obtained the agency for the Chevrolet car, but after only a few weeks' advertising, so many people in his community wanted one of these cars, that he could hardly get enough of them to supply the demand. The purchasers were mostly farmers, and this is the way he got in touch with them.

First, he inserted in the county papers an advertisement like this:

The Common People's Car

If you ever intend to buy an automobile, come in, as soon as you get the time, and look over the beautiful new car we handle. It is not too heavy, and not too light. It uses little gasoline, has plenty of power, and is up-to-date in every way. It is built for use, and the price is as popular as the car. Come in at once.

The Chandler Garage.

The above advertisement served to make the dealer known in the neighborhood, and brought many prospective buyers. But to better get in touch with those in the neighborhood who really figured on buying cars, the dealer used the following plan. He purchased wholesale a few boxes of good cigars, and had printed up several hundred small cards, containing the following reading:

Get a Cigar Free

On the back of this card, write the correct name and address of any neighbor who you know figures on getting a new car. Then drop the card in the card box, and get a good cigar free.

The Chandler Garage.

The box for the cards was made of wood, with a slit on the side for dropping in the cards; and the outfit, with a sign above it calling attention to the plan, was put up in a convenient place in the garage. Every car owner who came into the garage received one of the cards, and when he had filled this out, a cigar was presented to him. There were quite a few cards in the box every evening, and to each address the dealer sent the following circular letter:

Dear Friend:

If you need a car, or intend to trade off your old one, we have something to offer you that is sure to please you. We are now handling the Chevrolet car, the most popular automobile of the day for the price. It is not too heavy, and not too light. It is easy on tires, and takes little gasoline, but at the same time has lots of power. It is fully equipped with self-starter and electric lights, and is built for service and not for show. It is just the car for daily use, and the price will not give you sleepless nights. Many of your neighbors will soon be driving these cars, for the machines are going as fast as we get them home. We shall be pleased to have you come in and take a ride in one of these automobiles, so you can see for yourself what the cars are good for. But please come soon, or call us up by phone, and we will demonstrate the car at your home.

Yours cordially,

THE CHANDLER GARAGE.

As soon as any sales were made, these were reported to the local papers as news. Now it may be that the quality and price of this car had much to do with the business obtained, and it may also be that the agent's selling abilities were much above the average, yet who can deny that this dealer's success in making sales has been phenomenal?

In three months he sold forty cars, and orders were still received faster than the cars could be obtained. It seems to me that no dealer could do better with any kind of a plan in a town of only six thousand population.

The fact that there is always room at the top is due to the disinclination of so many people to exert themselves beyond a certain point. Teachers of Indian, negro, and some Oriental races, claim that the children of such peoples are extremely bright up to a certain point, then suddenly they come to a barrier which seems to mark, as it were, the shoal of their mental development. There are lots of people like that. They make a spectacular get-away, but after reaching the second or third rung of the ladder they seem unable to mount higher.

EDITORIAL REMARKS

Bankers and the Retail Automotive Trade

Omaha tradesmen have proved their right to be classed as keen business men by requesting the dealers to attend a recent gathering in the Nebraska metropolis and bring their bankers with them. It has too often been the case that officials of banks have not been as friendly to the automotive industry as members of the trade felt they should, but in practically all cases this has been due to the fact that little or no attempt has ever been made to prove to bankers how important the success of the automobile industry is to each locality. If the directors of local banks all over the country had been shown the stability of the retail trade in passenger cars and trucks it is likely that the big institutions in the East, that have prospered greatly from financing time sales of cars and trucks, would not have attained the size they have and the profits from these transactions would have remained in the localities where the vehicles were sold. The Omaha Automobile Trade Association has set an example for all other trade associations, big and little, in the country.

Stick to "Cash for Service" Plan

One war-time custom that should be continued permanently during peace times is the "cash for service" plan. Many owners of service stations had been running their business on a cash basis before the National Automobile Dealers' Association, upon the suggestion of government officials, asked the tradesmen of the country to put their business on a cash basis, but by far the greater majority of dealers had been permitting the service bills of their customers to run along until these accounts in many single instances amounted to hundreds of dollars, and had been gradually increasing in size for a year or more.

It is the universal opinion among men who have made careful study of the subject that putting service work upon a cash basis is the best plan for every one concerned. For one thing it has a tendency to discourage the careless motorist from running into a service station to have some slight task performed that he could very easily attend to himself, and it may be for this reason he does not pay much attention to the bills when they come at the end of the month.

But when a car owner knows that a bill for work must be paid before he can take the car away he will quite often attend to the small adjustment jobs himself, and is far more likely to take better care of his car so that it will not require the attention of service station mechanics as frequently as it did under the old "charge that to my account" system that was formerly in operation. It may be that a few customers will be offended

when informed they must pay cash for service, but in the majority of cases they are the kind of customers the tradesmen can well afford to lose, because he will surely have a bigger profit at the end of his business year.

One of the greatest advantages of the cash method of conducting service and repair shops is that the owner of them always knows just where he stands, and need have no worry about how large a proportion of his bills will be collected at the end of each month, as he will have no bills to send out.


Those Who Help Shows Help Themselves

Automotive dealers who sell anything that can be displayed should take advantage of this by taking space in their local exhibition, and helping the show along in every way possible. If the city or town has no regular show, or there is no suitable building that can be obtained for the purpose, the energetic tradesman can still take advantage of a chance to promote his business by conducting a show in his own salesroom. In different years this has been done in many of the big and little cities of the country. Several years ago the sales week plan was used by dealers of Newark, N. J., when there had been no regular show in that city during the winter. The Newark dealers fixed up their salesrooms with flags, flowers, and bunting, and made some very attractive displays, in several cases borrowing customers' cars that had special bodies.

While, of course, more good can be had from a show conducted on regular exhibition lines, and held in a big building, individual shows are very much better than none at all. This was proved by the number of sales that the Newark dealers made in their salesrooms during the special show week period mentioned. Even though the dealer may be located in a small place, and have the only automobile establishment there, it is still his plain duty as a business man to put on a show, and to advertise it in his local newspaper as well as by writing letters or telephoning men and women in his neighborhood who are able to buy cars.

Another thing that should be remembered about shows is that it is always time and money well spent for dealers to go to the shows held in big cities near their homes. When the tradesman from the small city or town visits the exhibitions in the larger places he can very often learn new and better ways to conduct his business by talking to representatives of the factory whose car he sells. Many of the distributors and district sales managers of the factories are arranging to hold sales conventions at shows in the larger cities and every dealer who can attend these affairs is certain to be benefited if he will do so.

Install a Curtis Air Compressor



The Curtis Sign

Illustrated above—is 10x14 inches—baked enamel on steel. Cannot be bought, but is furnished FREE with every CURTIS Garage Air Compressor—and cannot be had in any other way.

Display a CURTIS "FREE AIR" SIGN above your door—it inspires confidence and will help build your business. Motorists are looking for this familiar CURTIS slogan—because they know oil rots tires—and that a CURTIS Air Compressor furnishes AIR FREE FROM OIL, which means fewer blowouts, greater tire mileage and less repairs. The CURTIS is the ONLY Garage Air Compressor with the controlled splash oiling system that eliminates all danger of forcing oil into the air line.

CURTIS AIR FREE FROM OIL

Investigate the many exclusive features of CURTIS Garage Air Compressors. The line is complete—five sizes—stationary or portable. Just write your name and address on the margin of this advertisement—tear it out and send it to your jobber, or to us direct, for complete information and prices.

Curtis Pneumatic Machinery Co.
1515 Kienlen Ave., St. Louis, Mo.
Branch Office—530-U Hudson Terminal, New York City



“CROWE” Mechanical Fan Belts for Automobiles, Trucks and Tractors

The Last Word in Fan Belts

Unconditionally Guaranteed to give satisfactory service. **Adjustable—Efficient—Silent—Strong.** Steel and wire links produce strength and durability while sole leather blocks provide noiseless friction.



No. 8

CROWE MECHANICAL FAN BELTS

are not affected by heat, oil or water and will not Slip, Stretch or Break.

PRICES:

Standard Ford Sizes, adjustable to all models, each.....\$1.25
 Flat Type, any length or width desired, per foot......60
 V Type, any length or width desired, per foot..... 1.20

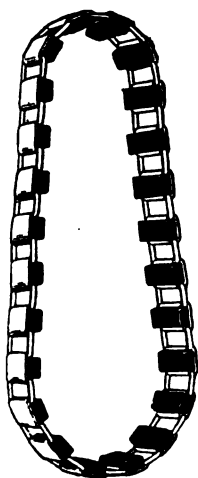
Attractive Proposition to Dealers: Profits are much greater than on ordinary fan belts, and the ultimate purchaser is sure to be satisfied.

Wire or write us for details of our sales co-operation policy.

Guaranteed Fan Belts for Automobiles, Trucks and Tractors



No. 18 (Adjustable)



No. 1

MECHANICAL BELT COMPANY

2014 Frederick Avenue

ST. JOSEPH, MISSOURI



Fix Casings and Tubes NOW

Dear Customer:

Let me fix up all of your casings and tubes that require attention.

This is the time for all good men and women motor car owners to come to this shop with their tire repair work. We are not very busy now, and "rush" jobs, that are of such frequent occurrence in the summer, seldom make their appearance in cold weather so that there is not even the slightest chance of any of our work being done carelessly.

Even though you may think none of your casings and tubes need attention we would advise that you have your car jacked up off of the floor so that the weight is taken from the tires during the months of inactivity. I would suggest that you bring your tires on the demountable rims along with the spare casings and tubes, and we can examine them together. Only in that way can you be certain that there is nothing that should be fixed before you will want the car again when the weather warms up. I strongly advise that the insides of demountable rims be shellacked as this prevents the tires from rusting to the rims. When we go over the casings and tubes together it may be that we will find a number of small cuts that should be vulcanized in order that they may not develop into more serious breaks that would delay you next summer when you might be in a hurry to get somewhere.

While it is true that my business is conducted on a strictly cash basis, as you know, it will not be necessary for you to lay out any money until you want to use the casings and tubes. That is, on repair jobs brought in before the first of April I will store the casings and tubes in my rubber storage room, and you need not pay the bill for the work until you get them in April or May, or whenever you want to put your car into service again.

No owner of a tire repair shop, whether that be his entire business or simply one of a dozen departments of his establishments, should permit his business to languish during the cold months. There is a great deal of tire repair work that floods into the vulcanizing shops in the first warm weeks of spring that could have been done much easier and perhaps better during the many colder days when the tire repair shops had little or nothing to do.

But this work will not make its appearance simply by wishing for it. The tire repair man must go and get it. In some cases the only way he can get it will be to drive to his customers' houses, and take the casings and tubes off the rims himself. In other instances he will be able to get it by telephoning to car owners. But oftener a letter written to every car owner in his locality will help bring in the business.

A letter that would undoubtedly help to

keep tire repair shops busy during the usual slack period is reproduced at the top of this article. Readers of this journal are invited to use as much or as little of the material in this specimen letter as they wish. If any reader has gotten out a letter on this subject that has proven successful, we would like to have him send it into us so that we can print it.

Dealers located in cities or towns with big farming districts nearby could use the letter plan to good advantage. They might have some copies of the letter printed on cards, and have these cards put into all of the farmers' cars they could see around the streets on the afternoons of Saturdays and holidays. At the same time as the cards were distributed among the farmers' automobiles personal solicitation would undoubtedly bring in quite a little business whenever it would be possible for the dealer or his representative to see the owners of the cars.

TIRE WORLD BRIEFS.

C. J. Hazen has just been appointed advertising manager of the General Tire & Rubber Co. at Akron. Mr. Hazen resigned a similar post with the Amazon Rubber Co. to go with the General concern.

Napoleon Lajoie, the famous second baseman, has retired from the diamond and will represent the Miller Rubber Co. out of the Cleveland branch. The great batsman, when not on the baseball field, has been selling Miller tires in Cleveland for some time.

C. L. Loveland, who has been advertising manager of the Waterloo Cement Machinery Corporation, Waterloo, Ia., has gone with the Mason Tire & Rubber Company, Kent, Ohio, in a similar capacity. D. J. T. Kennedy, whom he succeeds, has entered the Officers' Training School at Camp Taylor, Ky.

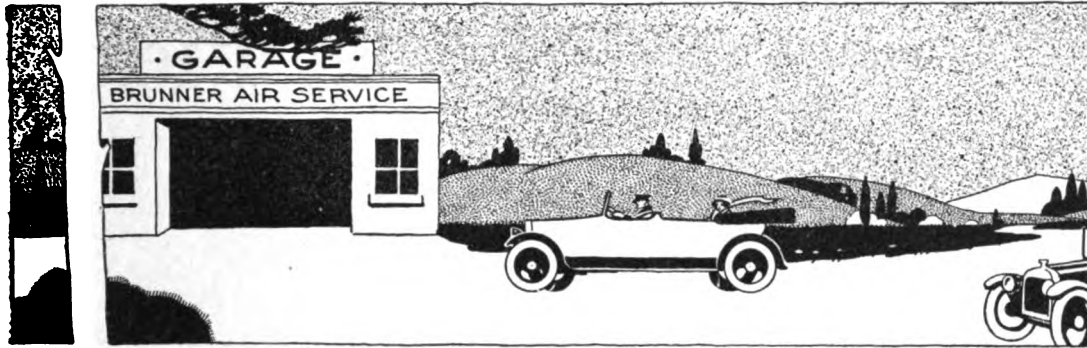
A. M. Whaley, formerly Southern district manager for The Kelly-Springfield Tire Company, has been appointed Southern sales manager for the General Tire & Rubber Company of Akron, and will maintain headquarters at Atlanta.

Thomas L. Moore, appointed Southwestern District Manager for the General Tire & Rubber Company, will have headquarters at Dallas.

New Company to Market Non-Lubricant Bearings

The Perfection Roller Bearing Co. has been formed to place on the market new types of roller bearings, among them a non-lubricant bearing, also a bearing to install on badly worn Ford rear axles. C. M. Carr, a former automobile trade publisher, heads the organization as president, and William R. Bullion, formerly with the Elgin Motor Car Co., is secretary. The company's headquarters are located at 117 N. Dearborn St., Chicago, and the factory is at Englewood.

Mr. Carr states that the new organization will have something distinctive to show the trade by show-time and will exhibit at Milwaukee and Chicago. The company seeks business among the large users of bearings on models designed especially to fit customers' equipment. A catalog line for replacement work will eventually be sold through jobbers to the repair shop and garage trades.

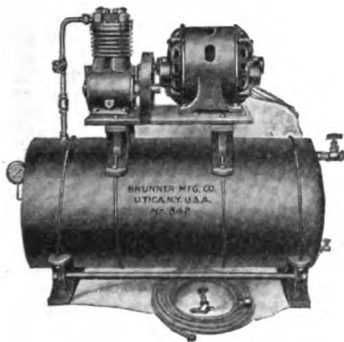


THE BRUNNER AIR SIGN MEANS GARAGE SUCCESS

This red and blue enameled sign is distinctive—not easily confused with others. The motorist looks for it. It brings him to you for service and sales. Furnished FREE to users of Brunner Air Compressors.

THE ability to render permanently satisfactory service spells success in every line of business. The Garage man is no exception to the rule. Be his organization ever so perfect and his equipment the best—if there is but one point in which service is lacking or not always available or satisfactory, that is enough to keep hundreds of dollars away from him.

A dependable air compressor is a vital part of the garage service. The motorist expects to find air service in every garage and he will go to the one that renders the most dependable service.



NO. 542 OUTFIT

Ideal for installation where space is limited. Has ample capacity for garage housing up to forty to sixty cars. The motor is $\frac{1}{2}$ H.P., securely bolted to substantial cast iron base and mounted on a 32-gal. Welded Open Hearth Flange Steel Air Tank tested to 300 pounds.

The compressor is our No. 102, 2-cylinder air cooled, each cylinder fitted with a safety valve that can be instantly set for any desired pressure and absolutely dependable under all conditions.

The outfit includes air gauge, check valve, 25 feet of $\frac{3}{16}$ in. "Redstall" air hose, connected to one No. 82 needle valve on one end and having automatic tire connection on the other.

When used with our Model M Controller this outfit is entirely automatic.

Brunner Air Compressors

The Brunner Air Compressor was designed especially for garage use. It is built in the largest, best equipped plant in the world devoted to the exclusive manufacture of garage air compressors. The employees of this plant take great pride in the product and every part of the work and every piece of material is the very best. Bearings are as carefully made and fitted, cylinders as carefully ground, piston rings fit as perfectly as in a high priced automobile engine.

On a Brunner compressor there is no need for attachments to help the motor carry the load—no restriction of lubrication to pull down the efficiency, increase wear and run up bigger-than-necessary electric bills. Maximum efficiency is attained with a minimum of operating and upkeep cost. Brunner compressors are built to operate under the hardest working conditions, day out and day in, with but little attention and yet perform consistently and satisfactorily.

Send for Catalogue No. 15 showing the most complete line of small air compressors on the market and the name of the jobber covering your town.

If you want assistance in planning or improving your air service our factory engineers are at your command. Tell us how we can serve you best.

Brunner Manufacturing Company

General Office and Plant, Utica, N. Y.

Cincinnati Branch, Cincinnati, Ohio



In the Truck and Trailer Field

The cold months of the year are one of the best periods in which to sell trucks and trailers. This is true of both the city and country dealer, as motor trucks can make progress over country roads and city streets so covered with snow as to make progress difficult, if not impossible, for horse-drawn vehicles.

In the cities the winter time provides weather conditions that in themselves do a great deal of the missionary work needed to convince merchants that motor trucks provide more efficient hauling than horse-drawn vehicles, and the city motor truck dealer should be especially energetic in getting after business at this time. The farmers are not so likely to need motor trucks during the winter as city merchants but the truck dealer located in the farming country can do a good deal of missionary

work in the months when there is little passenger car riding except for strictly business purposes. He can obtain orders for trucks to be delivered a few months later when the farmers need them.

The reasons that make the cold months good ones for pushing the sales of trucks apply to pushing the sale of trailers also. One of the advantages of trailers for winter hauling is that by using one or two trailers along with a truck it is possible to keep the truck running a larger percentage of the time. The trailer can be backed up to the loading platform and left there for an hour or so to be filled with a load that requires a good deal of time to be put in place while a truck can be kept in motion and doing useful paying work while the trailer has been motionless.

Trucks Go About Business in Tropics or Near Arctic

"Whether it be 'north of 53' or in the heat of the equator the motor truck goes about its business, which is the business of supplying all people with the requirements of life," says G. W. Werden, export manager of the Denby Motor Truck Company, of Detroit, who now is established in his New York office whence he directs the world trade of this pioneer builder of internal gear trucks.



G. W. Werden.

"There are about 150 countries in the world and some 500 commercial centers," continued Mr. Werden, "and no motor truck is used in more of them than the Denby, which may be found in operation in the Fiji and Samoa Islands, Singapore, Siam, French Indo-China, the Philippines, South Africa, South America and every European country, excepting Germany.

"Such was the scarcity of gasoline that seventy Denbys ran with gas bags in Norway during the war, while for those in New Zealand the carburetors were changed

to permit of the use of distillate. The foreign market promises to be a feature of the business now that we have received offers of space on the ships plying to the Orient, while restrictions to Europe are being removed."

The export department is an integral part of the Denby organization and Mr. Werden is intimately acquainted with conditions, trade relations and other merchandizing details, in addition to being conversant with several of the world languages.

Cooke Is Advertising Head for Denby Motor Trucks

A recent addition to the official staff of the Denby Motor Truck Company, of Detroit, is Frank S. Cooke as advertising manager. His career as a newspaper man in Detroit covers the full period of the development of motor vehicles in that city. For years he has been automotive editor of the Free Press.

From the start of the specialized manu-



Frank S. Cooke.

facture of motor trucks Mr. Cooke has been a student of the problems of transportation, so that his advent in the tribe of Denbymen is a natural evolution.

MOTOR TRUCK MOVEMENTS

Hereafter Ohio, Kentucky, West Virginia and parts of Pennsylvania and Virginia will be looked after by E. T. Sutton as district manager for the Denby Motor Truck Co., of Detroit. Mr. Sutton's headquarters will be at Cleveland with the Ohio Oldsmobile Co.

Manager Frank R. Wood of the Lippard-Stewart Motor Car Co. announces that there has been a complete reorganization of the concern. The stock and equipment has been moved from Buffalo to Syracuse.

Some recent additions to the ranks of Gramm-Bernstein truck distributors include the Altoona Overland Co., Altoona, Pa., for central Pennsylvania; Capitol Motors Corporation, Richmond, Va., for Virginia; Peoples Motors Co., Louisville, Ky., for Louisville and vicinity, and the W. W. Phelps Motors Corporation, Birmingham, Ala., replacing the Newell Auto & Machinery Co.

Fred J. Vandemark has been appointed special representative for the Acme Motor Truck Co., of Cadillac, Mich., and will travel in the eastern part of the country. Another Acme appointment is that of J. C. Benedict, who is district manager for Delaware, Maryland, Virginia and North Carolina.

R. W. Walker has been appointed assistant general manager of the Hurlburt Motor Truck Co., of New York City. He joined the Hurlburt organization four years ago as a salesman. After a year and one-half he was made assistant sales manager, which position he filled for six months and then became sales manager.

Forrest J. Alvin, manager of the United States Motor Truck Co., of Cincinnati, O., announces the appointment of the following dealers: F. A. Jack, of Louisville, Ky.; Stearns Motor Car Co., of Youngstown, O.; Creele Motor Car Co., of Birmingham, Ala.; Webb & Bush, of Lexington, Ky., and Henry Mossback, of Seattle, Wash.

SHALER

5 MINUTE GARAGE VULCANIZER



Big FREE Offer to Repair Shops

To quickly introduce this wonderful new Shaler Garage Vulcanizer—we will send *Absolutely Free*, with each outfit—an assorted supply of Shaler Patch-&-Heat Units, that will make repairs enough to more than pay for the outfit.

This new gang vulcanizer was designed especially to meet the demand from Garages and Repair Shops for a large capacity, quick action, dependable vulcanizer, that uses the convenient Shaler Patch-&-Heat Units. These handy Units are very popular for making tube repairs. Over 10,000,000 punctures were repaired with them last year. No other method is so quick, convenient and satisfactory. With the new Ex-Long Patches you can make repairs 4 inches long. It's easy to make any kind of tube repairs—four at one time—in 5 minutes, with this simple outfit.

Complete Outfit Only \$7 Free Patches Enough to Pay for It

Our low List Price \$10 is subject to 30% trade discount, making the Net Price to you only \$7—and with the outfit we will send you Free Patches enough to more than pay for it, so that the outfit costs you practically nothing.

Write Us Quick—or Ask Your Jobber

and take advantage of our *Liberal Introductory Offer* of enough Free Patches to pay for the entire outfit. This is positively the biggest money maker you can put in your shop. You risk nothing, because it will pay for itself the first day, and gives you the quick service that pleases old customers, brings new customers and increases your profits. Write at once, as this is a limited offer, for a short time only—to introduce this new model.

C. A. Shaler Company, 363 Fourth St., Waupun, Wisconsin

ROUND
PATCH
1 3/4 INCH

OBLONG
PATCH
1 3/8 x 2 1/4 INCH

EX-LONG
PATCH
1 3/4 x 4 INCH

Burgess Device Proves Virtue In Ride Over Rough Roads

"With ten thousand miles of road test and a year's work, every detail to the last cotter pin tried and retried, we are now ready for the final drive," said the manager. "I have asked you gentlemen to go because I am afraid to trust myself for the final judgment, I'm too enthusiastic."

The party consisted of the manager, a Ford fan who has owned and driven every model of the Ford car, Bill, who drove the 10,000 miles in the test car, and myself.

I wish I knew how to tell every Ford owner about the honest-to-goodness virtues of the Burgess rebound check and shock absorber in combination with a Ford car.

Sixty miles is not a long way in an automobile, but it would be hard to find greater variation in road conditions if you drove a month. The first ten miles was over the roughest macadam I had ever seen, that is to look ahead, but it seemed to smooth out as we advanced. In spite of Bill's skill in finding the holes and the speed of 30 miles an hour we never felt the shocks.

I became interested and the Ford fan said it was "wonderful." But Bill and the manager said this was only half bad and to wait for the frozen clay ahead. I looked as Bill turned off the main road and braced myself for the shocks over frozen clay deeply rutted and full of holes. But the shocks never came, although Bill only pulled down to 23 miles per hour.

It didn't seem real, I began to ask questions. Was it hard to steer? Did they always drive at this speed on such roads? How many Fords had they broken up in the 10,000 miles? And did they use special tires? The manager answered it was a regular Ford, that is, all but the Burgess recoil check and shock absorber, and the tires were regular Ford sizes, 30x3 and 30x3½, and had gone about 7,211 miles. This one car had traveled the entire 10,211 miles and the steering was easy enough for Bill to use one hand to eat an apple.

I noticed that we could talk without shouting although by this time we were on a rough macadam road again and going 30 miles an hour. But the car and engine were quiet and the manager said it had been ever since they began to use the rubber top spring.

By this time I had lost my fear and no longer braced myself. I was enjoying my ride, for we never felt the shocks, no matter how rough the road.

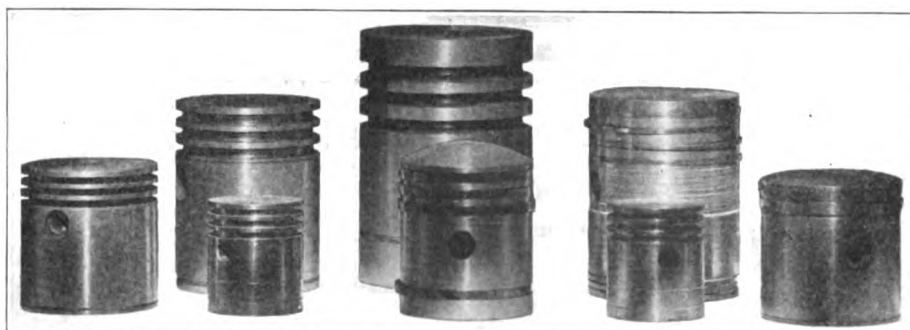
When we got into deep sand the car handled perfectly. On the way home over a good road that was wet and which Bill insisted on driving at 35 to 40 miles per hour, the manager waxed enthusiastic. He told me the Burgess device rode so won-

derfully that they tried to build it to last forever. All bearings were special self lubricating or hardened and the springs were of rubber and the finest tested steel. The malleable iron is the kind we make in our foundry that all the best car and truck builders come to us to buy, concluded the manager.

When we got back to the factory I examined the car carefully. There were no squeaks or rattles. The fenders were tight and the whole car seemed as sound as new.

The manager asked me how many sets I thought he could sell, I answered every one who owns a Ford will buy if you can find a way to let them know what you have shown me today.

Full information about the Burgess shock absorber will be sent on request, as well as complete dealer particulars. All inquiries should be addressed to the Burgess Shock Absorber Co., 1323 S. Michigan Ave., Chicago.



Light-Weight Storm Pistons.



C. B. Johnson.

Storm Firm's New Service of Light-Weight Pistons

As a companion line to the reborring machines and other automobile repairing devices, the Storm Mfg. Co. has established a service for the purpose of providing special light-weight pistons of the highest quality for any make of engine, and furnish them in any desired oversize. When the great number of different makes and models of pistons now in use are taken into consideration some idea of the magnitude of this service may be had.

At the present time core boxes for over 1,000 different styles and sizes are being used, and about an equal number of patterns, the new ones being added as required. The Storm company numbers all these, and careful record is kept for immediate reference. This insures the greatest possible promptness in filling orders with the least possible chance for error or delay.

The Storm light-weight pistons are made of a special close-grained, semi-steel metal. They are made as light as practical. Yoke-shaped reinforcements are used to provide ample strength, combined with lightness. This light weight is a most desirable feature, reducing vibration, stress and wear. They are finished in size with extreme ac-

curacy and are very durable as they can be fitted closely. Dealers who wish full details and trade prices can obtain them from the Storm Mfg. Co., Thompson, Iowa, by mentioning the AMERICAN GARAGE & AUTO DEALER.

C. B. Johnson to Market Red Star Timer for Fords

C. B. Johnson has become general manager of Auto Components, Inc., Chicago. For several months Mr. Johnson was in military service and took up his new work when released by Uncle Sam. He has a wide acquaintance in the automotive field, having formerly been sales manager of the Advance Automobile Accessories Corporation at Chicago.

The Auto Components concern has been recently organized to market the Red Star timer for Ford cars. It is located at 56 East Randolph street, Chicago.

Deliveries Now a year and a half ahead

New Elgin Six

\$1395

f. o. b. factory



*"They copied all they could follow, but they couldn't copy my mind,
And I left 'em sweating and stealing a year and a half behind."*

—KIPLING

FOR eighteen months—while our factories were building war trucks—the Designing, Engineering and Executive Staffs of the Elgin Motor Car Corporation devoted their best talents and energies to the designing, testing and perfecting of the New Elgin Six.

Competent motor car critics agree that this New Elgin Six, with its 36 improvements and refinements, represents such a big step forward that it is fully a year and a half ahead of the times.

Before commencing production on the New Elgin Six in November, 1918, our test cars received many thousands of miles of the most severe and exacting trials under every conceivable condition, and they have more than satisfied our highest expectations. They have brought us the most enthusiastic praise from our dealers and Elgin owners.

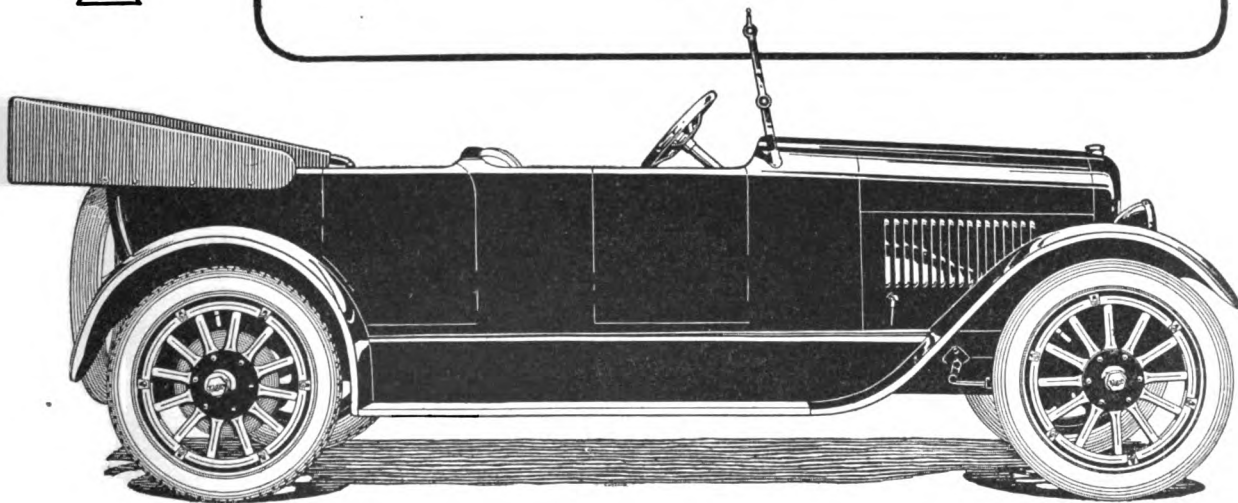
Dealer's Biggest Money-Maker

This big, roomy, impressive quality car, with its handsome and stylish appearance and its many points of superiority, is bound to be the easiest selling Light Six for 1919. Priced at only \$1395, f. o. b. factory, you will agree with us that it is the biggest value on the market today.

Our Bulletin No. 3 discloses money-making points of big value to live dealers. Write or wire today for your copy and particulars of our big national advertising campaign.

ELGIN MOTOR CAR CORPORATION

Argo, Illinois



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Tractors and Farm Lighting

Tradesmen located in districts where there are prosperous farms should be busy among the farmers during the cold months. In case the dealer has not already taken on the agency for a tractor he will be better fitted to select the proper machine for his locality after he has discussed the subject with farmers to whom he has sold cars, trucks or accessories.

During these months of early darkness the tradesman who is handling the farm electric plant will be able to sell more of these devices than during the warmer months when there is more daylight. There is greater need at this time for artificial light than in any other period of the year, and the farmers are not as busy as they are when the ground is free from snow.

Many of the winter time tasks on a farm could be done better and quicker if power, such as is supplied by the farm electric plant, was available. The dealer who has a demonstrating power plant mounted on a car, and is thus able to show the virtues of his device easily in different parts of his territory will have a big advantage. In a good many cases he will be able to show so clearly the advantages of the farm electric plant through its use to drive machinery—such as feed cutters, milk separators, saw mills, etc., that very little stress will need to be laid on its value as a source of inexpensive and instant illumination.

IN THE TRACTOR FIELD.

Announcement of the appointment of the Watson Automobile Co. of Sioux City, Iowa, as Parrett tractor distributors for Northeastern Nebraska, Northwestern Iowa and Southeastern South Dakota has been made by the Parrett Tractor Co. The Watson concern is planning the sale of Parrett tractors on the same broad, merchandising plan which has brought success in the distribution of Mitchell and Kissel automobiles.

The Automobile Sales Co. of Memphis will distribute Cleveland tractors in Tennessee and the Little Rock Motor Car Co. will handle them in Arkansas. In Oklahoma the sales of Cleveland tractors will be handled by the Cardwell-Lyman Sales Co. of Oklahoma City.

Frank H. Smith has joined the sales organization of the Parrett Tractor Company of Chicago. His duties will be that of district sales manager, which is similar to the work he has been engaged in for the past twelve years with such well known automobile concerns as Studebaker, Hudson and Chalmers.

Chas. W. Tway Co., Atlanta, Ga., Southern distributors of Haynes automobiles and the Wilson trucks, have been appointed distributors for the Dauch Mfg. Co., Sandusky, makers of the famous Sandusky tractor.

Frank Bishop, doing business under the name of The Briscoe Motor Sales Co., St. Louis, Mo., has taken on the Sandusky tractor. He has organized a special selling department for this new product.

U. B. McCurdy has been appointed district manager for the Cleveland Tractor Company with headquarters at 1307 Waldheim Building, Kansas City. His territory comprises Kansas, Nebraska, Colorado and Wyoming, also portions of Missouri, Iowa, and South Dakota.

Paul L. Odle, well known in the automotive industry, particularly among motor truck men, has just recently joined the Parrett Tractor Company of Chicago. He was formerly associated with both the Republic and Denby motor truck companies. He was manager of purchases of the latter concern prior to joining the Motor Transport Corps of the U. S. Army, where he was assigned to Gen. Drake's office. Mr. Odle will handle work of a very special and important nature in connection with the purchasing end of the Parrett business.

Major M. B. Morgan has been appointed chief engineer of the Cleveland Tractor Company, Cleveland, Ohio. For fourteen years he was engaged in automobile engineering, until June, 1917, when he was called into the service of the Government as assistant to the chief of the Ordnance Department at Washington. In that capacity Major Morgan was in charge of the designing and development of the caterpillar tanks and tractors used for war purposes.

Electric Service Concerns Organize an Association

Executives of representative electric service stations organized the National Automotive Electric Service Association re-

The winter months are the best time for the gathering of information regarding the right kind of tractors to be used in any one section. Even if the dealer cannot spare the time to drive around and visit his farm customers and friends, a good many of them would undoubtedly come to his place and talk the matter over with him if he would write or telephone to them. With more or less spare time on their hands they would be willing to discuss the matters of type of soil, nature of crops, average size of the farms, and other things that must be taken into consideration when selecting the kind and size of tractor to be sold.

The tractor schools that are conducted by different tractor manufacturers and state institutions afford the chance for dealers to learn something about these machines. While it may not be possible for the dealer to devote the necessary time to personal attendance at one of these tractor schools, it might be money well spent for him to send one of his mechanics or salesmen at his expense.

Every automobile tradesman who is not handling tractors and farm electric plants should learn the profit to be made on this kind of automotive merchandise and begin selling them as soon as he selects the right types for his locality.

cently at a meeting in Chicago. The object of this organization is to improve the present unfair conditions of spurious part manufacturers.

The association will promote and improve service on the electrical equipment of automotive vehicles in this country by cooperation between its members and others interested in the same line of business. It will neither endorse nor recommend any individual, firm or company or any scientific or engineering production, but the opinion of the association may be expressed on subjects affecting the public welfare.

Membership will be by firms rather than individuals, each firm being entitled to two representatives with one vote for each representative. Any firm whose entire business or a fair proportion of its business is devoted to service on the electrical equipment of automotive vehicles is eligible to membership.

Unfair, dishonest or dishonorable conduct on the part of any firm member shall be sufficient cause for expulsion by a three-fourths vote of the representatives present or voting at any regular meeting of the association.

The officers elected were: President, Arthur Jones, president Arthur Jones Electric Co.; vice-president, A. E. Urban, manager Pellet Magneto Co.; secretary, John W. Busicka, proprietor Motor Electric Equipment Co.; treasurer, R. J. Hardacker, manager North East Electric Co.

**Auto
Repairs**

GARAGE

**R. For Sick
Motors**

**Marco Piston
Service**

**Marvel Cylinder Re-
boring Machine No. 5**

**Co-operative
Advertising**

The Trade-Drawing Magnet

The MARVEL CYLINDER RE-BORING MACHINE NO. 5—MARCO PISTON SERVICE and Co-operative Advertising Help brings increased sales and profit to Automobile Dealers and Garage Men.

CONSIDER THESE POINTS CAREFULLY



The installation of a MARVEL CYLINDER RE-BORING MACHINE No. 5, and MARCO PISTON SERVICE enables you to re-bore engine cylinders and fit them with over-size Pistons, and we help you get the business.



The MARVEL has variable feed speeds and automatic feed release—permitting the operator to attend to other work while re-boring—doubling his day's output.

The MARVEL is Power Driven—Automatic—Efficient—Substantial and easily operated.

The MARVEL has a friction disc feed ranging from 26 to 120 threads to the inch.

The MARVEL is accurate to plus or minus five ten-thousandths of an inch at the extreme extension of the boring bar.

The MARVEL is speedy—from five to twenty times faster than a grinder.

The MARVEL has capacity—it will handle any gas engine cylinder from a motorcycle to a tractor.

Write at once for our special proposition.

Marvel Machinery Company

1307 South Third Street

MINNEAPOLIS, MINN.

In writing, please use address in full—it expedites delivery.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

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A
MARVEL
and a
SERIES
of
attractive
adver-
tisements
in your
LOCAL
PAPER.
SIGNS
for
YOUR
window.

A
MARVEL
and
Beautiful
Illustrated
LETTERS
in
COLORS
mailed
YOUR
LIST
Confiden-
tial Price
List for
Re-boring.



Patented Process to Fix Scored Cylinders Brings Much Business

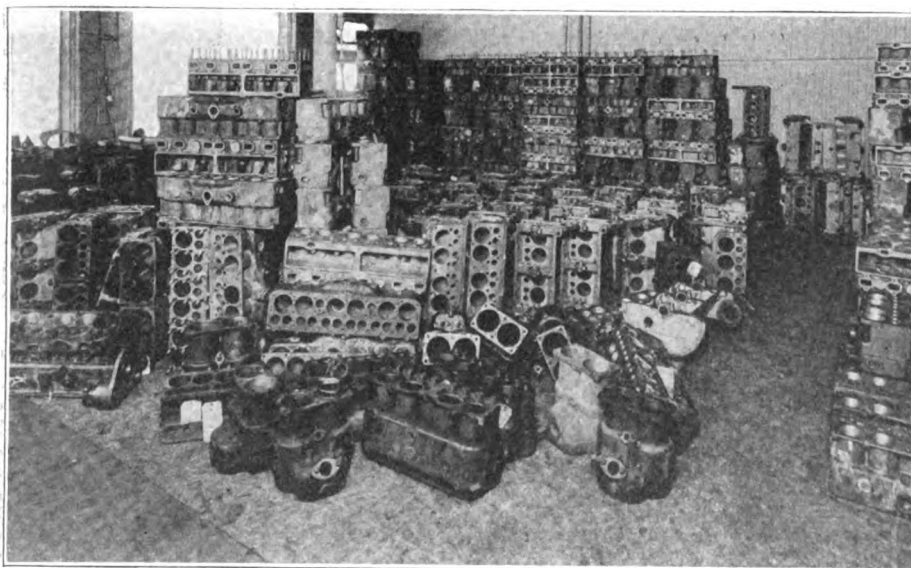
Ownership of the United States patents covering the process of repairing scored cylinders has greatly expanded the business of L. Lawrence & Co. during the last few years. When an article on the subject by David Baxter was printed in the November number of this publication neither Mr. Baxter nor the editor of the American Garage & Auto Dealer realized that repairmen might use the process and thus become liable to suits for infringing the patents.

L. Lawrence & Co. began business at Newark, N. J. in 1862, making copper work for manufacturing concerns. The head of the firm invented the Lawrence patented process for repairing scored cylinders in 1915. The business grew so fast that it was necessary to open a branch plant at Detroit in May, 1916. The Chi-

The Chicago plant serves many dealers all over the usual territory covered from Chicago and also has customers as far away as New Orleans, Denver and St. Paul. Ralph De Palma has warmly praised work on racing car cylinders done for him by the Chicago plant.

Suits brought by L. Lawrence & Co. against infringers of their patents have been won in four States: Illinois, Pennsylvania, Massachusetts and New Jersey. The firm makes special prices to automotive dealers who send scored cylinders in to be repaired and this policy has been largely responsible for the rapid growth of the business.

Manager A. L. Cooper of the Chicago plant declares that the greatest care is taken to finish all work so carefully that there are no "come-backs" on the firm's policy of guaranteeing all work. New mechanics who are learning the process are



One Day's Work at Lawrence Detroit Plant.

ago branch was opened just after the firm had exhibited in the 1916 automobile show at the Coliseum, and a branch at New York City was established about the same time as the one at Chicago.

A branch plant was opened at Cleveland in 1917. On the Pacific Coast the demand for the Lawrence service has required the concern to establish plants at both San Francisco and Los Angeles. The Chicago branch plant has been getting so much work from Wisconsin and Northern Michigan that a plant has just been opened at Milwaukee. This was done to avoid the shipping delays getting cylinders in and out of Chicago. Every winter the Chicago plant has repaired a great many cracked water jackets for dealers in Wisconsin and the upper peninsula of Michigan and the Milwaukee plant will shorten the time required for repairing.

never permitted to finish a job alone until they have had at least four weeks practice, although they are paid during that period. Mr. Cooper says the Lawrence officials know that money spent in thoroughly training the mechanics saves both trouble and time later on.

Wallace C. Hood Becomes a Paige Car Distributor

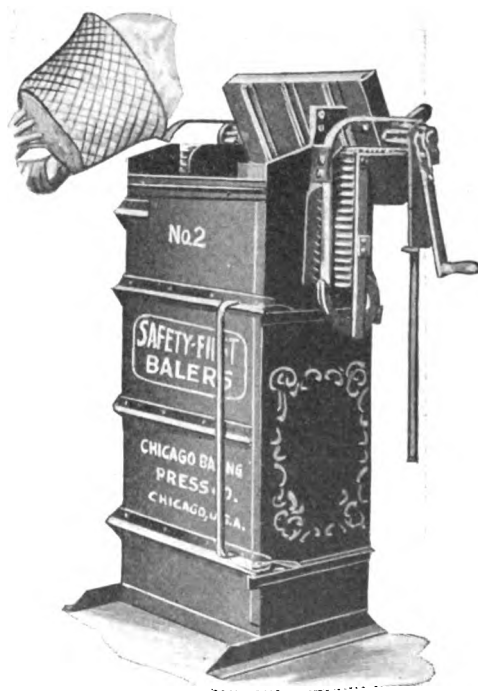
Wallace C. Hood has disposed of his interests in the Foster-Hood Sales & Service Co., Detroit, to his partner, James H. Foster, who will continue to operate the business. Mr. Hood has just acquired an interest in the Noyes-Killy Motor Co., Kansas City, Mo., and will act as manager of that company's Kansas City branch. The firm will distribute Paige cars exclusively.

Mr. Hood is widely known as a sales executive, having at different times been general sales manager for the Empire, Chalmers, Standard motor truck and other organizations. Three years ago he organized and launched the Wallace C. Hood Service Bureau in Detroit and for two years the organization handled the Detroit interests for dozens of big distributors and manufacturers located out of Detroit, and also marketed the entire factory outputs for several large accessory manufacturers. One year ago he resigned from the Hood Bureau and became general sales manager for King cars, recently resigning to open the Foster-Hood company.

Baling Press Brings Cash from Waste Paper Stock

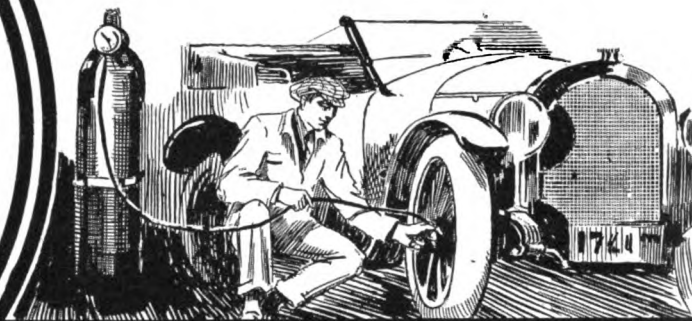
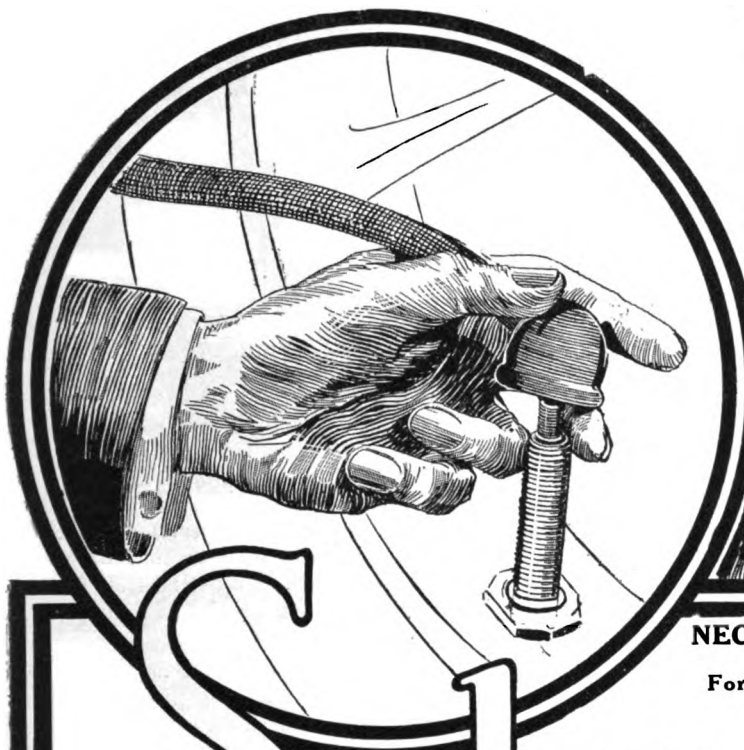
Even though the ending of hostilities has put an end to the enforced economy in the use of paper, tradesmen who accumulate stocks of waste paper can obtain money for this waste material which they have been throwing away or burning. Because paper manufacturers can use this old material in the production of new stock with much smaller amounts of chemicals than are needed with raw materials, there is always a ready market for waste paper.

In order to sell the waste paper readily, however, it is necessary to bale it, and for this purpose a number of all-steel baling presses are being produced by the Chicago Baling Press Company, one of which is herewith illustrated. There are a number



of different styles of baling presses made, and readers wishing further information and trade prices can obtain them by writing to the Chicago Baling Press Company, 305 South La Salle street, Chicago, and mentioning the AMERICAN GARAGE & AUTO DEALER.

It's New!



NECESSITY IS THE MOTHER OF INVENTION

For a new disease there must be discovered
a new remedy.

Schrader

AUTOMATIC INFLATING VALVE

prevents EXOSMOSIS of the air-tank.

If you look it up you will find that EXOSMOSIS means the passage of gases through membranes or porous media from within outward.

The SCHRADER AUTOMATIC INFLATING VALVE prevents the passage of your costly compressed air from within your siphon or tank outward into space.

The customer for whom you have installed a "free air" station does not mean to do it, but he does forget to turn off the flow of air after he has inflated his tires at your "pump." The result is that some of your "free air" goes into tires but most of it escapes and is wasted.

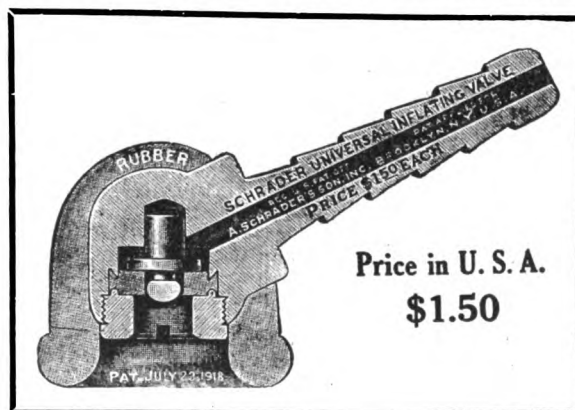
We now offer you the means of preventing this waste. With a Schrader Automatic Inflating Valve at the end of your air hose the air supply is *automatically* shut off the minute you remove the appliance from the tire-valve.

It is protected by a thick covering of rubber so that it won't dent or scratch the enamel of the car.

No Garage Can Afford To Be Without One.

At your dealer's, or

A. SCHRADER'S SON, Inc., 783-793 Atlantic Ave., Brooklyn N. Y



Price in U. S. A.
\$1.50

How to Make the Shop Pay

Mechanics Are Shown That Loyalty Is Needed to Assure Success of General Service Station

By E. B. HINRICHSSEN.

As is often the case even in the best regulated shops, mistakes were made. Try as hard as he would, Bill would often get hold of incompetent or slow workmen. Of course they would be weeded out as soon as discovered but often a great deal of damage was done before the discovery. This was particularly troublesome during the first few months of business.

There are always some people who look for excuses to blame a new enterprise, especially if it is a departure from regular and established practice. A few of the dealers had gone into the new organization half heartedly and were only too quick to pick faults. Mr. Brown and Bill kept these mistakes to themselves as much as possible but some of them were bound to leak out. They were common property in the shop and there was no way of keeping the shop men from talking outside.

At first there was no spirit of loyalty and many of the men really thought they were better off working in the dealers' shops. Some of them had a habit of dropping in at the old places of an evening and talking with the salesmen. To these they told their troubles and grievances which soon became public property.

It was some time before Bill discovered how things leaked out and when he did he was puzzled as to how to stop it. He disliked to go to Mr. Brown with all his troubles, for he knew that his friend was over his head in work and problems of his own. He finally decided to use his own judgment and work it out in his own way.

In order to decide how to do it he first made a careful study of conditions. The men were as well or better paid than before. They had better working conditions and more conveniences. The general foreman was a man of tact and judgment and knew how to handle men. The group foremen were carefully picked and as far as he could see were good men for their places.

He could only conclude that personal friendships for the old employers and lack of realizing how much damage careless talk caused was at the bottom of it. He decided that the best thing was to do and the most important was to make them more friendly to the new organization than they were to the old ones.

Working toward this end, he invited all the shop men to a supper or dinner at the plant. The affair was entirely informal and he made every effort to make the affair seem purely social. There was a good feed and smokes and a talk afterward. Bill

opened the talk by making a speech and he made it in his own way. There was no one there but the mechanics and Bill and they nearly all had known him and worked with him for some time. Bill addressed them somewhat as follows:

"Fellows, I want to talk a little while and I may say some things that you don't like, but if I do, tell me what they are and I will explain later. If any of you want to dispute what I say, just get up on your hind legs and dispute and the best argument will win.

"We have been in the new place only a short time and naturally there have been a lot of mistakes made. You fellows have made some of them and the rest of us have made a lot more. Now mistakes are all right if they only happen once. A mistake is all wrong if it happens twice.

"We are up against a new proposition and we must get the kinks ironed out before everything will go smooth. That part is all right and we are making progress, but don't tell outsiders everything that goes wrong inside the plant. I don't know how many of you tell these things nor who they are. I don't want to know. I want it stopped.

"Don't tell John Smith that the reason he didn't get his car on time was because the final tester got drunk or that the billing clerk forgot to send the job up to the shop for a few days or that the foreman put a bum mechanic on the job and that it had to be done over. Don't tell John Smith anything. If he asks you, tell him you don't know why his job was late, but that you do know that he had the best job done that you ever saw. That'll make him feel a whole lot better and will do you more good.

"Don't run over to the Buick agency and tell the manager that we have a lot of Ford mechanics over here and that you are the only Buick man on the job. He has some money invested here and it might make him uneasy. Anyway, you know very well it isn't so. If you can't boost, don't knock. Give the place a chance. You are getting good money and will get better if things go well. It's up to you to make them go well."

There was no doubt more of this, but at this point Mr. Brown, who had been eavesdropping, sneaked away for fear he might get caught. It looked to him as though there might be a stormy session and he did not wish to be involved. Besides, he thought Bill knew better how to talk to them than he would and anyway it was none of his business. From what he could get from Bill the next day, the conference

lasted until late and there were many arguments and the lie was passed a number of times, but as Bill expressed it, they cleared up a lot of things.

"And that is not going to be the last meeting by any means, Mr. Brown. There's going to be one once a month at least and oftener if we can make it. I told that bunch last night that they had to come to time and go to work and quit blowing their bazoos. I told 'em I couldn't fire a man for telling stories out of working hours, but that I could beat blazes out of anybody I caught at it and that I would.

"All my old bunch backed me up and I don't think we will hear much more of it. The boys are working better today than they have at any time since the change, so I guess we did some good. If they will just keep their mouths shut now, it will be all right."

Mr. Brown wisely kept still and let Bill work it out his own way. He heard rumors of war once or twice but paid no attention. The fact that efficiency in the shop increased and that the ugly stories stopped was enough to satisfy him. After he had noticed the improvement and watched for a while, he asked Bill to meet him at his office one evening.

"Bill," he said, "we will have to establish a welfare department. We know little or nothing of the personal affairs of our people or how they are getting along. Take the case of Pete, the rear end man. He reported sick four days ago and has not been back. He may be dead for all we know or he may be without proper care. As far as I know, no one has been to see."

"Don't you fool yourself," replied Bill. "I was out to his house the night he went home and I have sent out every day since. I know that he has a good doctor and that everything is being done that can be. He is a mighty sick man but Doc. says he will pull through all right. He told me he did not have any money saved and I told him not to worry, for the house would see to it that his bills would be paid. He is a good man and a hard worker but has a big family. I figured that we would send his pay out to him the same as if he was at work if we could stand it. Of course, we can't keep it up forever, but I'll go as far as I can."

"Right you are, Bill," said Mr. Brown. "but do you know as much about the rest of them as you do about him?"

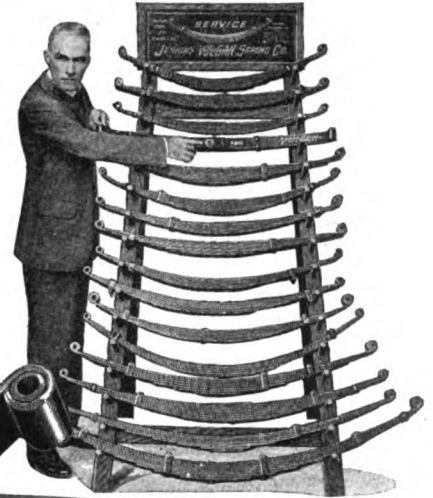
"Got 'em all card indexed, Mr. Brown. Address, telephone, married or single, number of children and some remarks of my

(Continued on page 40.)

Spring Service for A Nation.

VULCAN

The Replacement Spring



Sign and Display Rack FREE

The Display rack and Service Sign is furnished **Free** with the first order, including appropriate advertising helps.

America's Motorists

have been educated by national advertising to look for VULCAN Service signs when in need of Spring Replacements.

Performance of VULCAN Springs on their cars has convinced them of the Superiority of VULCAN.

VULCAN Dealers

are profiting by the demand created through national advertising, combined with supreme quality of VULCAN Springs and convenience of VULCAN Service.

VULCAN Service

embraces the needs of both motorists and dealers, supporting each to the highest degree of efficiency. A constant stock of over 100,000 VULCAN Springs furnishes the source of supply. The individual supremacy of each spring, because of the "built in" quality, assures satisfaction to user and distributor.

Become a VULCAN Dealer and enjoy the benefits of a ready made market.

Write for particulars regarding VULCAN.

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1024 Hennepin Ave.
209 S. Houston St.
538 Franklin St.
29 Caldwell St.
48 Auburn Ave.



Welding, Cutting and Brazing

Care of Welding Equipment

BY DAVID BAXTER.

Last month we discussed ways and means of caring for the heavier parts of the welding apparatus. These devices are not more important than the smaller parts, although perhaps seemingly so. The regulators, gauges, torch, etc., should be looked after the same as a skilled mechanic in other lines cares for his favorite tools.

No kind of delicate machinery is absolutely foolproof. Much less a thing that is subjected to so many changes in temperature as the welding torch. All tools and machinery wear out in time but the ones that are well taken care of last the longest, and usually produce the best results. A device designed to produce as nice results as the welding apparatus should therefore receive good care. A worn, loose, or damaged part is a waste of time and money, especially if a little care would have kept it in shape.

The Regulator.

This part of the equipment is popularly known as the reducing valve; because it reduces the tank pressure to the desired welding pressure. Since the welding pressure should be accurate and constant it follows that the regulator ought to receive exacting care. Many times the success of the weld depends on the accuracy of the regulator. The inner mechanism of a regulator is comparatively fragile but if it receives proper attention will last a long time.

A very good way to understand your regulator is to obtain a sectional drawing and make a careful study of it. Of course one may take a regulator apart and thus learn the principle of it, but this is not recommended as the correct proceeding for a novice, unless he has a discarded regulator.

The fundamental principle of all regulators is the same: between the tank pressure and one or more springs is a diaphragm. When the tank pressure is stronger than the springs the diaphragm is forced outward to the extent to which the pressure is the stronger. That is, when the pressure is heavier than the tension of the springs the diaphragm will bend outward. A plunger is attached to the diaphragm. This plunger opens or closes the inlet from the tank according to the pressure; if the pressure is greater it closes; if the springs are strongest it opens.

The tension of the springs is varied by hand with a handle on the regulator for this purpose. Or in other words the tension of the springs may be changed by a turn of a screw. From the foregoing it will

be seen there is a good chance for the seat or plunger and the diaphragm to wear out through constant movement. This is especially true if the movement is sudden. Such is the case if the operator turns the gas on suddenly while the tension is on the springs. The seat or plunger is thus thrown with considerable force against the inlet nozzle, which might destroy the seat or diaphragm at once. The natural deduction is to release the tension on the springs by unscrewing the hand screw before turning on the gas.

Another misuse of the regulator is to reduce from a higher to a lower pressure while the torch valves are closed. If we desire to reduce the pressure while working we should do so with the torch burning. Or at least allow the gas to escape while screwing in the hand screw. If we don't the seat will again be forced against the nozzle when the torch is opened or lighted after the reducing is accomplished. This sudden movement is liable to ruin the diaphragm besides putting undue wear upon the plunger and inlet nozzle.

Scored Cylinder Repairing

The process of repairing scored automotive cylinders described in our November number by Mr. Baxter is covered by two United States patents owned by L. Lawrence & Co. The latter concern has many branches and makes special prices to dealers sending scored cylinders to be repaired. There is an article about the process and the Lawrence firm on page 28 of this journal.—The Editor.

Therefore always reduce the pressure with the torch valves open, this is the main thing in caring for a regulator. The movement of the diaphragm, seat, and springs, however, whether necessary or uncalled for, is bound to cause more or less wear. This fact must be taken into consideration, and repairs or replacements made when needed. The repairing or replacing of worn parts should not be attempted unless the operator knows what he is doing, it is better to send the regulators to the factory for repairs. At any rate the regulators should be repaired as soon as they show signs of being out of order, one part out of order may cause the other parts to get that way. We may save money by having this one part renewed immediately.

A good scheme is to have on hand an extra diaphragm and seat in case there is not time to send the apparatus to an expert.

A first class mechanic can insert them if he understands the workings of a reducing valve. It is not out of place to once more caution the operator not to use any kind of grease or oil on any parts of a regulator especially the interior. It might cause an explosion if the oxygen should come in contact with oil.

Gauges.

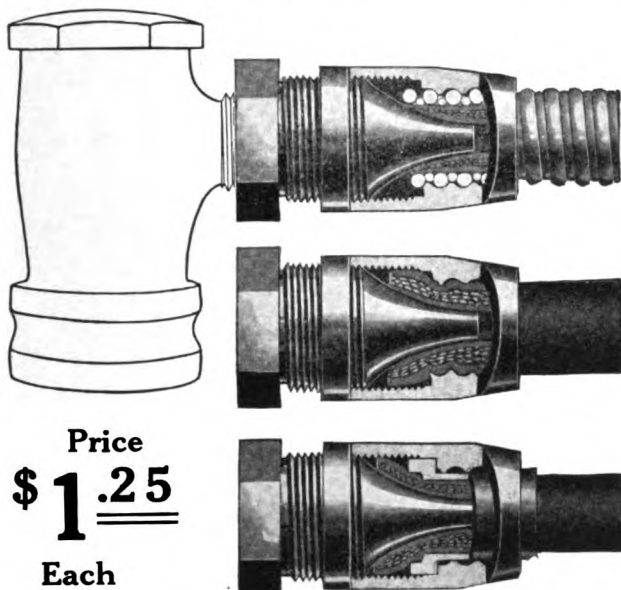
The construction and use of gauges on the oxyacetylene welding apparatus is generally familiar to the welder so it is scarcely necessary to give a description here. So we will pass directly to the care of this important part of the equipment. If tank acetylene and oxygen are used there should be two gauges to each tank. If only one gauge is employed the operator finds it hard to tell just how much gas is used on each job of welding, or how much pressure remains in the tank after the job is finished.

The low pressure or regulator gauge is an index to regulator trouble. If the regulator and gauge do not stay in agreement there is something wrong. For instance: when the torch is closed the gauge sometimes creeps up several pounds. A few pounds is permissible but if it creeps as much as ten or fifteen pounds you may know it is time to investigate.

A gauge of first class construction needs but little attention. Still there are a few things that may be done to insure a long life and correct operation. First, do not allow it to fall or be knocked around. If the glass is broken replace it immediately. Moisture is liable to enter the interior of a gauge with a broken glass, or even a cracked one. This is bound to work adversely upon the parts through rust, dirt is also likely to collect and cause an incorrect registration.

For the same reasons it is not well to permit the equipment to remain outdoors in all kinds of weather. In event of the gauge going bad it is not best to fool with it while the pressure is on. A good gauge has a safety back but this will not prevent serious consequences. It is better to shut off the pressure when examining it. I have known gauges to "stick," in which case the operator deliberately shook it and tapped the back in an effort to make the hand release, this without even shutting off the torch. The procedure will work but it's risky business, too risky, and should never be done. Keep away from this part of your apparatus with a lighted torch in your hand.

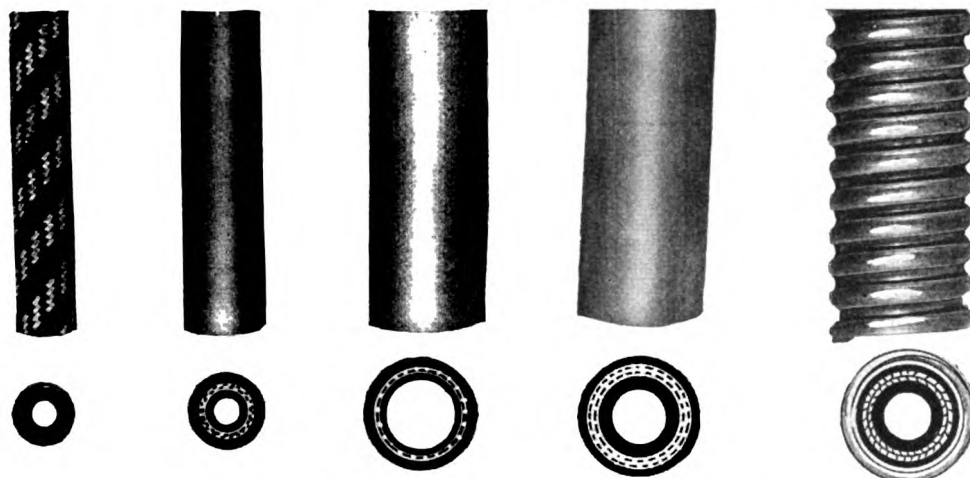
Do not tamper with your gauges in an effort to make repairs unless you are an expert. The average gauge is a delicate instrument, hard to fix once it is out of order. Better send it to the factory or get a new one at once.



Price
\$ 1.25
 Each

Here is a
**HOSE
 CONNECTION**
 that is really
 a remarkable
 proposition

ROMORT



One connection takes *all* sizes of hose as illustrated, or any hose from $\frac{5}{16}$ " to $\frac{3}{4}$ " outside diameter, regardless of inside diameter

The connection at the other end is $\frac{1}{4}$ " pipe thread and fits all Romort Automatic Air Valves or other connections with standard $\frac{1}{4}$ " pipe thread.

A jobber with this one coupling in stock can meet all demands within those sizes, either plain, braided cover, or metal armored hose.

Made throughout of high duty brass, white nickel finish.

Factory Sales Representatives:

THE ZINKE COMPANY

1323 S. MICHIGAN AVE., CHICAGO, U. S. A.

Manufacturers:

ROMORT MFG. COMPANY

OAKFIELD, WIS.

::

CHICAGO, ILL.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Capt. Harry W. Ford

Captain Harry W. Ford died of pneumonia in St. Luke's Hospital in New York City December 18. He served in the advertising department of the National Cash Register Company, and was later advertising manager of the Sheldon School of Salesmanship. He went to Detroit in 1909 as advertising manager of the Chalmers Motor Co., Hugh Chalmers having seen and appreciated his work in the cash register organization. He was secretary and assistant general manager of the Chalmers Company when he resigned in 1914 to organize the Saxon Motor Car Corporation, of which he was president and general manager for about four years. After this country entered the war he went into the Motor Transport Corps and was commissioned a captain.

Road Drainage Discussed in Government Bulletin

The first essential feature of an improved road is adequate drainage, and another prime requirement, wherever a hard surface road is to be constructed, is a firm foundation. These facts are emphasized in Bulletin 724, "Drainage Methods and Foundations for County Roads," just issued as a professional paper by the Bureau of Public Roads, United States Department of Agriculture.

The purpose of the bulletin is to supply information concerning the proper methods of draining road beds constructed of various kinds of soil, and under different topographical conditions, and also to explain how foundations may be designed to suit the soil conditions, the road surface and the system of drainage.

Some of the topics treated in the bulletin are primary soils, drainage, design of surface drainage, gutters, drop inlets and catch basins, subdrainage, foundations, and specifications.

Lt. E. Ralph Estep

Lieutenant E. Ralph Estep was killed in action near Sedan in November, according to word received last month by President Alvan Macauley of the Packard Motor Car Company. As editor of Motor Age in the early days of the industry he became well known to the trade. Later Lieutenant Estep acted as advertising manager for the Packard Company, and left the Detroit manufacturer to go into advertising work in New York City. He was a war correspondent in France, Saloniki and the Balkans. A few months ago he received a commission as lieutenant in the United States Army, and went to France as a combat photographer.

AUTOMOTIVE NEWS NOTES.

Wade H. Leach has been appointed assistant general sales manager of the Dort Motor Car Company, of Flint, Mich.

Harry A. Biggs has been appointed general sales manager of the Studebaker Corporation, South Bend, Ind. Since 1909 Mr. Biggs has been an executive of Frank Seaman, Inc., and one of its directors. He began his advertising career with the old Hampton agency, where he was treasurer, and later established a business of his own that was absorbed by the Seaman agency. Mr. Biggs has been identified with some of the largest advertising campaigns, such as American Tobacco Co., Regal Shoes and Studebaker.

C. C. Winningham, who was with the government for several months, first with the Fuel Administration and then with the Information and Education Service of the Department of Labor, has started a new advertising agency in Detroit. Accounts that have already been secured are the Hudson Motor Car Company, Essex Motor Car Company and the Stewart Truck Company. He was formerly advertising manager of the Hudson Motor Car Company. Previous to joining the Hudson Company he was for several years with Lord & Thomas, of Chicago.

Otis H. Adams, formerly with the Martin V. Kelley Co., New York, is now associated with the Connecticut Telephone & Electric Company, Meriden, Conn. The Kelley agency will continue to handle the advertising of the Connecticut Telephone & Electric Company.

Salter Scammon Lockwood is now advertising manager of the H. W. Johns-Manville Co., New York. He was advertising manager of the Toledo Scale Company several years. Mr. Lockwood is well known for his story "De Luxe Annie," which has been dramatized and has been successful as a play under the same title.

George T. Bryant has been appointed sales and advertising manager of the Hide, Leather and Belting Co., Indianapolis. He has been connected with the Russell M. Seeds Company, Inc., advertising agency of Indianapolis.

Ralph H. Ratliff has retired as a member of the Butler Manufacturing Co. organization at Indianapolis and has been succeeded by J. Fred Holland, who has had wide experience in manufacturing and sales. Mr. Ratliff has again become a farmer.

Edward F. Carson has been made manager of the lubricant department of The Acheson Graphite Co., Niagara Falls, N. Y. He joined the concern last March, having formerly been connected with the Pyrene Mfg. Co.

Arthur J. Palmer has been appointed advertising manager of Thomas A. Edison, Inc., Orange, N. J., succeeding the late Leonard C. McChesney. Mr. Palmer has been assistant advertising manager since 1915. Previous to that time he was sales and advertising manager of the Brand Manufacturing Company, Brooklyn. For a number of years he was associated with the American Press Association, New York, in various capacities, and for three years was publicity manager for the Montague Mailing Company, Chattanooga, Tenn.

Robert J. Mooney has joined the Dooley-Brennan Co., Chicago. He had been associated with the Wm. H. Rankin Co. and before that was associate publisher of the Chicago Inter Ocean.

Roger J. Gilmore, assistant general manager and vice-president of the Packard Motor Car Co. of New York, has been made president to succeed Emlen S. Hare, recently elected vice-president of the Packard Co. at Detroit.

W. E. Biggers, for more than four years advertising manager of the Hyatt Roller-Bearing Company, and now advertising manager of the motor equipment division, United Motors section of the General Motors Corporation, which includes the advertising management of the Hyatt Roller Bearing Company, the Klaxon Company, the Jaxon Steel Products Company, and the Harrison Radiator Corporation, is leaving February 1 to accept the position of assistant to President Calvin P. Bentley of the Owosso Manufacturing Company, at Owosso, Michigan.

Frank M. Eldredge, sales manager for L. V. Flechter & Co., New York carburetor manufacturers, has been advised of the resignation of Andrew Kirkpatrick, vice-president and secretary, who has obtained a commission in the motor transport division of the United States Army.

Victor W. Peterson, formerly advertising manager of the Stewart-Warner Speedometer Corporation, has become general manager of the Wm. R. Johnston Mfg. Co. at Chicago.

H. R. Keeling has resigned his position as advertising manager of the Haynes Automobile Company to become vice-president and a director of the Siderer-Van Riper Advertising Company, Indianapolis, Ind. Previous to his connection with the Haynes Company Mr. Keeling was identified with the advertising and merchandising activities of the Armstrong Cork Company, Pittsburgh, Pa.

J. S. Burdick, who for the past six years has been body engineer at the Locomobile Co. of America, in charge of model body designs and construction, has enlisted in Government work for overseas service as automotive engineer in connection with the fuselage of aircraft construction.

Geo. H. Treviranus has assumed the duties of sales manager of the Gemco Mfg. Co., Milwaukee. He succeeds L. A. Raasch, who resigned to become affiliated with Walden-Worcester, Inc., Worcester, Mass. Mr. Treviranus is thoroughly conversant with the GEMCO policy, having been advertising and export manager the last two and a half years. For five years previously he successfully conducted sales campaigns for the Evinrude Motor Co.

George R. Bury, assistant general manager of Packard distribution, has been appointed general manager of the Packard Motor Car Co. of Chicago, succeeding H. M. Allison, who resigned recently.

Leonard W. Smith, for two years past in charge of copy and plans for the Dunlap-Ward Advertising Company, Cleveland, has joined the Powers-House Co. of that city.

Albert Gough has been appointed manager of the service department of the Liberty Motor Car Co. at Detroit. His experience includes production work with the Shaw Electric Crane Co. at Muskegon and he was also with the service organization of the Chalmers Motor Co.

GLOBE AIR COMPRESSORS

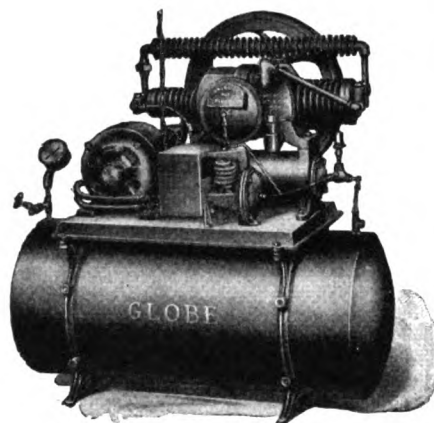
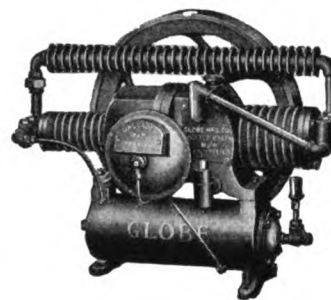
WORK LIKE A CHARM

You will find them the
most satisfactory air com-
pressor for you to use.

Whatever your requirements are, we
urge you to select a GLOBE.

Successful garages all over the United
States are using GLOBE, which has
had no small part in popularizing their
"air free service."

As we make a variety of models and
types suitable for the small, as well as
the large garage, we recommend that
you mail us the inquiry coupon at-
tached, answering questions thereon
carefully, which will give us a better
line-up as to your particular wants.



Globe Manufacturing Company

BATTLE CREEK — MICHIGAN

MAIL INFORMATION COUPON

GLOBE MANUFACTURING COMPANY, Department B2, Battle Creek, Mich. A. G. & A. D

Gentlemen: Without any obligation on my part, please send full information on the items checked
(x) below:

- ☐ Air Compressor for Line Shaft Drive.
☐ Air Compressor for Direct Motor Drive. ☐ With Motor.
☐ Automatic Air Plant for Free Air. ☐ With Motor.
☐ Air Compressor with Air Cooled Gasoline Engine.
☐ "DEAD EASY" Tire Pump for resale.
☐ I have or can get Electric Current ☐ Single Phase. ☐ Two Phase. ☐ Three Phase. ☐ Direct.
☐ Voltage. ☐ Frequency. ☐ Cycles.
 I have power ☐ Steam. ☐ H. P. ☐ Gas Engine. ☐ H. P. ☐ Electric Motor. ☐ H. P.
 I have a ☐ Garage. ☐ Tire Shop. ☐ Machine Shop.

Name.....Date.....

Address.....

CHICAGO AUTOMOBILE SHOW

Demonstration Booth No. 89
Coliseum Gallery
Jan. 25 to Feb. 6

NEW YORK AUTOMOBILE SHOW

Demonstration Booth No. 374
Madison Square Garden
February 1st to 15th

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Mechanical and Engineering Problems

Spark Advance Differences

Question—Why is it that on some cars the spark advance has so much effect and on others it seems to have little or none? Take the Ford, for instance. It is necessary to advance and retard the spark according to the speed of the car. If you keep it too low you cannot get the speed and the engine heats at any speed. If you advance it too far, the engine has no power and knocks at slow speeds. I use a Ford in my practice, but have ridden a great deal in other types of cars and have noticed that in some the drivers use the spark lever the same as I do and in others the driver throws the lever all the way up at the start and does not change it no matter what the speed.

I should think that the same rule should hold good in all cases, as I understand that the variation in spark is intended to take care of the time of explosion and compensates for the various engine speeds. I have also seen cars that have no spark advance at all. If it is not asking too much, I wish you would give me fairly detailed information on these points.

J. D. F——, M. D., Illinois.

Answer—In present motor car practice there are two general types of ignition. One of these is by means of a commutator or distributor and the other by a high tension or low tension magneto. In the first type, of which the Ford is one, the spark is practically the same in intensity at all speeds. The current originates from a generator and is distributed and stepped up through a transformer or coil, as it is usually called.

This first type is also divided into two general types. One of these uses the commutator and distributes the primary or low tension current. That is, the current is distributed before it goes through the transformer side of the spark coil. The Ford is of this type. In the other, the current goes to the coil first and is distributed from a high tension distributor to the spark plugs. This type requires only a one unit coil, while the type using the commutator requires a coil for each cylinder.

In this type the margin of advance is large. The spark has the same intensity at all speeds, as mentioned before, and it is necessary to vary the spark according to engine speed in order to get the best results.

In the magneto type the current is generated in the magneto itself. In the high tension magneto the primary current is stepped up through a coil in the magneto, and in the low tension is stepped up through a separate coil. There is a very slight margin of advance in this type, but a certain compensation is obtained on account of the

The mechanical and engineering problems of the craft are discussed monthly in this department in a helpful manner by E. B. Hinrichsen, for nine years a garage mechanic, service expert and manager, ten years chief engineer of the Wolf Motor Co., later with the Frederickson Engine Co. and consulting engineer with the Western Electric Co. He is now service manager for the Chicago Republic Truck Co. When shop information is desired, write Mr. Hinrichsen, care this office.

fact that the intensity of the spark varies according to the speed of the mechanism. The spark becomes hotter as the speed increases.

It is the practice to set the spark quite a bit farther ahead on the magneto type. This type can be set with a fully retarded spark a little ahead of dead center without danger of kicking. When the motor is once started and running at normal speed the spark can be fully advanced and kept there except at very low speeds and the variations in the intensity of the spark will give an almost automatic advance and retard.

Some cars are equipped with magneto ignition without any spark advance at all and depend entirely upon the increased intensity of the spark for the advance effect at higher speeds. There are some cars equipped with an automatic spark advance. This device consists of an advance mechanism controlled by a governor. The governor advances or retards the spark according to engine speed and usually operates on the centrifugal principle.

The subject is an interesting one and almost any standard work on motor cars describes the various types much more fully than I have done here. Would suggest that you consult one of these works for the details and assure you that the time will not be wasted.

* * *

Rear Axle Trouble

Question: I have a Ross 8 automobile and the bearings in the rear axle have given me considerable trouble in breaking gears. If you think advisable to replace the axle with one that is standing up, kindly give me address of companies who can furnish it.

J. M. D., Colo.

Answer: I should think it would be cheaper to install a different type of bearings. I am of the opinion that the housing can be chambered to take them. I have not seen a Ross for some time and am just a little in doubt as to the exact dimensions of the housing. If you think you would rather change axles, The Puritan Machine Co. of Detroit ought to be able to fix you up. You might write them and see what they could furnish one for.

Wiring a 1913 Reo

Question: Will you please tell me how to wire a 1913 Reo, which is equipped with a National magneto and coil, model B. A. What terminal point do we have to connect the batteries to? This car was in a wreck, and if you can send me a sketch of the low tension magneto and coil, and where the wiring is connected to the batteries, to show the wiring for the head-lights, tail-lights, and side-lights. Is there a book published that treats on all kinds of magnetos, coils, and vibrators? If there is, will you please send the name and where it can be bought?

GEO W. S., Minn.

Answer: The National magneto and coil connects practically the same as the Splittdorf low tension. On the primary side run the wire from the center of the breaker box cover to the terminal marked "M" on the coil. Sometimes this terminal is marked "A." Run the lead from the binding post on the magneto that connects with the insulated contact point to the terminal marked "C" or "B" on the coil. Run the third lead from the ground binding post on the magneto to the terminal marked "G" on the coil, or if this terminal is not marked run it to the only unused terminal. These three terminals are marked "C" or "B" on the coil. Run two leads from the batteries to the two top terminals on the coil. It is better to use dry cells for this rather than the storage battery.

On the high tension side run the leads to the spark plugs the same as in any other system. There is a little window in this magneto to look in and see the position of the distributor. Run the high tension lead from the center of the distributor to the terminal arranged for it on the coil.

The ignition wiring on this system is not connected in any way with the lighting system. I presume you have a Gray & Davis starting and lighting system. This is the single wire type and the lamps are all in multiple. That is, there is a separate lead running to each lamp and the frame of the car is used for a ground or common return. The Gray & Davis people will gladly send you a complete wiring diagram of this.

There are a number of works on ignition lighting and starting. I think a glance through the advertising section of this magazine will give you this information. If not, I will be glad to mail you a list from which you can select what you want. If the information given on the wiring is not clear enough, write me again and I will send complete wiring diagram.



Every garage needs the protection a complete N. C. R. System will give

Peace is bringing increased competition in your business.

You must meet that competition. You cannot afford to run the risk of losing a single cent of profit.

A modern National Cash Register and an N. C. R. Credit File will enable you to get all your profits on every transaction in your garage.

Because—

(1) They will make it possible for you to run your garage with the least expense.

(2) They will prevent the mistakes and disputes which cause loss of trade.

(3) They will enable you to give customers the quick, satisfactory service which wins new trade.

(4) They will give you the accurate records which you need to control your business.

(5) They will protect your money, your clerks, your customers, and yourself.

THE NATIONAL CASH REGISTER COMPANY, Dayton, Ohio

Offices in all the principal cities of the world

Old registers repaired, rebuilt, bought, sold, and exchanged

Accessories and Garage Equipment

FOSTER AUTO REPAIR CREEPER WILL BE AT CHICAGO SHOW

Visitors to the automobile show at Chicago in the Coliseum and First Regiment Armory will have an opportunity to examine the Foster auto repair creeper. This article which is so useful for repair shops, service stations and garages, will be exhibited at space 39 in the First Regiment Armory. Messrs. Jessop and Thompson will have charge of the exhibit.

EKERN RUNNING BOARD SUPPORT FITS ALL MODELS OF FORDS.

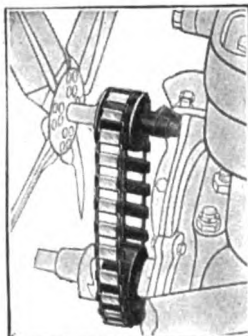
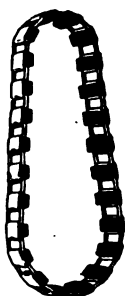
The Ekern running board support for Fords fits all models of these cars, and is very easily attached. It is constructed of two pieces of channel steel, riveted together and heavy enough so that they will not bend nor spring.



The makers declare that it will hold fenders, shield and running board in correct position, and that it eliminates vibration. It comes complete with bolts ready to attach, and is marketed by the H. G. Paro Co., 1410 So. Michigan Ave., Chicago, Ill.

CROWE FAN BELT FOR FORDS BUILT ON CATERPILLAR PLAN.

It is said by the Mechanical Belt Co. that the Crowe mechanical fan belt was "built for service." The Crowe fan belt was invented by a Ford owner to meet the demand for a belt which would not be affected by the conditions under which automobile belts run.



As leather and canvas are rapidly af-

ected by oil, heat and water, the inventor decided to construct his belt of a steel chain into which blocks of oak tanned sole leather are embedded. There are three parts to each link. By sliding out a leather section the chain opens, and is closed when the leather section is replaced, making it impossible to add or remove any number of links.

No metal touches the pulleys, and no change in the pulleys is necessary. All that is needed is to remove the old belt and replace it with a Crowe belt. The steel chain is constructed on the caterpillar principle, and will not stretch or break. The blocks of sole leather furnish smooth, silent friction service of unusual durability. The combination of steel and leather makes the belt impervious to oil, heat, dirt, or water.

Owing to their sturdy construction Crowe belts are especially fitted for heavy duty. The combination of strength, long work, and simple attachment makes them much used for truck or tractor service. The belts are guaranteed for 15,000 miles of ordinary passenger car service. Readers wishing further particulars can obtain same by writing to the Mechanical Belt Co., St. Joseph, Mo., and mentioning the AMERICAN GARAGE & AUTO DEALER.

NEW ROMORT CONNECTION FITS MANY SIZES OF HOSE

Many sizes of hose may be used with a new connection produced by the Romort Mfg. Co. and distributed by the Zinke Co.

The connection takes all sizes of hose, from 5/16" to 3/4" outside diameter, regardless of the inside diameter. The connection at the other end is 1/4" pipe thread and fits all Romort automatic air valves or other connections with standard 1/4" pipe thread. The connection can be used with either plain, braided cover or metal armored hose.

Full particulars and trade prices will be sent to dealers who write to the Romort Mfg. Co., Oakfield, Wisc., and mention the AMERICAN GARAGE AND AUTO DEALER.

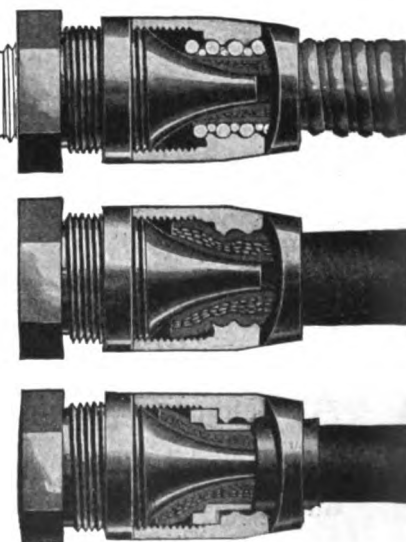


WAGNER CLEANING DEVICE SCOURS ENGINES THOROUGHLY

Efficient operation of any mechanical device depends largely upon the condition in which it is kept. Dirt and dust are destructive—they grind into the different parts and if left long enough are bound to reduce efficiency and eventually cause trouble. Many parts of the engine are easily enough kept clean because they are conveniently located, but there are other parts more inaccessible from which trouble may be expected sooner or later unless they are carefully gone over and cleaned out.

In order to provide a means of getting at and cleaning out even the remotest part of the engine the Wagner Specialty Co. has placed on the market the Wagner engine cleaner. This is worked out along lines similar to the ordinary atomizer. Two pipes, one for air and the other for kerosene, are used which converge as they approach the metal nozzle into which they connect. On the other end is a wooden handle which enables the cleaner to be more easily operated. When in use the air supply is attached to the tube marked "air" and rubber tubing, furnished with the cleaner, is inserted into a pail containing the kerosene.

It is essential that a constant flow of air be maintained. The cleaner cannot be worked with the ordinary foot pump. It is stated that only six pounds of air pressure are required for operation and that one quart of kerosene will clean any engine. Readers who wish full details and trade prices can obtain them by writing to the Wagner Specialty Co., 1902 Broadway, New York City, and mentioning the AMERICAN GARAGE AND AUTO DEALER.



Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....
.....
.....
Name
Address

NOKORODE SALTS GOOD

FOR SOLDERING IRONS

Repairmen who use soldering irons are advised by the M. W. Dunton Co. not to use sal ammoniac or other acids to brighten their irons, as they eat up the tinning and corrode the work.

The Dunton people advise dissolving one pound of Nokorode salts in one gallon of water. This solution should be used as a dip to clean and tin the iron, as well as to flux the work, and it is claimed better results will be had at less cost. Readers who write to the M. W. Dunton Co., Providence, R. I., and mention the AMERICAN GARAGE AND AUTO DEALER will get full particulars and trade prices.

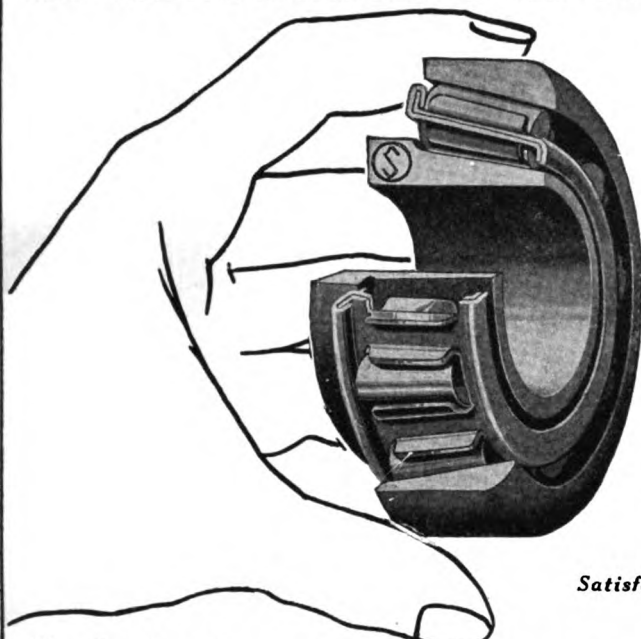
SMALLEY DANIELS HEADS FIRM MAKING MANY ACCESSORIES

A very extensive line of accessories is being marketed by the New Era Spring & Specialty Company at Grand Rapids, Michigan. The fact that the concern's president is Smalley Daniels—who is one of the real veterans of the automotive industry—is assurance that the line will be a complete one and of the highest quality. An especially extensive line is made especially for Ford cars, including tire carriers, spring bumpers, springs, accelerators, contact points, and radiator coolers.

The company makes "Better" springs for many different types of cars, including Buick, Chalmers, Chandler, Chevrolet, Dodge, Ford, Hudson, Hupmobile, Maxwell, Overland, Reo, Saxon and Studebaker.

The New Era plant produces a very extensive line of spring bumpers, for both front and rear, and has a wide enough variety of types to fit any car.

The mechanical superiority of the F.W.S. Roller Bearing makes them "First Choice"



All of the good features which a roller bearing should have are incorporated in the design of the F. W. S. Bearing. These are the features which mean better service and longer service in the F. W. S. improved retainer:

PERFECT ALIGNMENT OF ROLLERS—Broad-wings of Cage provide broad and smooth surface against rollers, so rollers cannot get out of line.

EXTRA STRENGTH—Strong Cage is secured by double walls of high carbon steel, outer edge reinforced by turned edge, giving three thicknesses at that point.

EQUAL BEARING SURFACE—Due to the double walls of retainer having equal wings on each side of rollers.

LUBRICATION—The wings provide pockets to retain the grease, but accumulated dirt cannot pack in around the rollers.

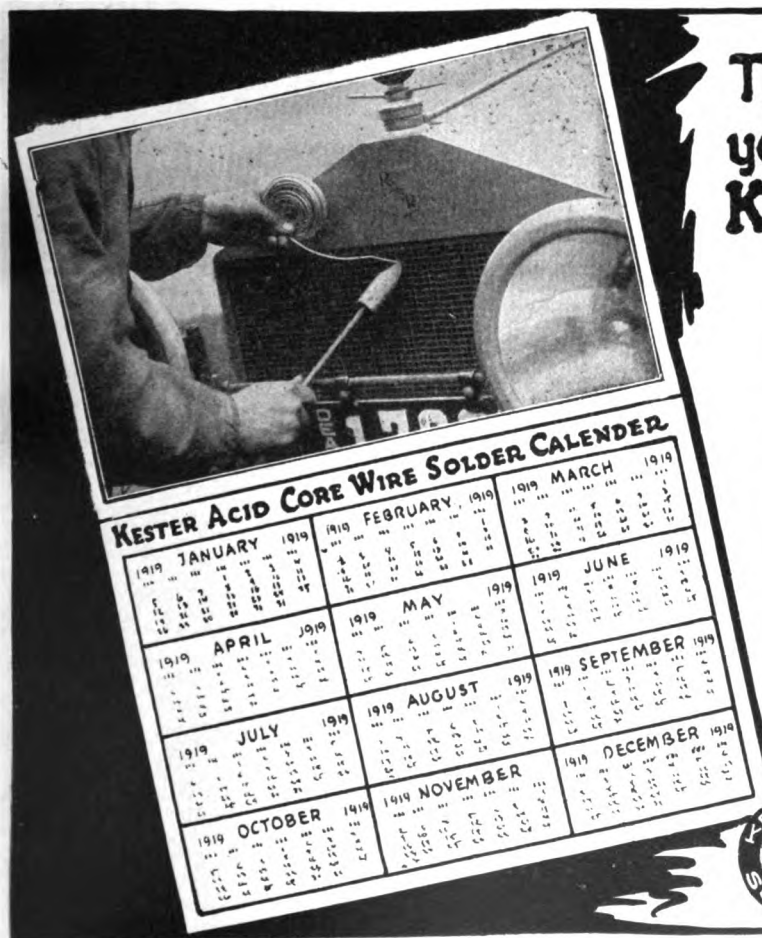
CONES AND RINGS made of especially prepared steel properly tempered and ground to absolute accuracy in size and contour.

*Satisfaction Guaranteed. Dealers and Garagemen
Write for Further Particulars*

For Ford and
Chevrolet
front wheels



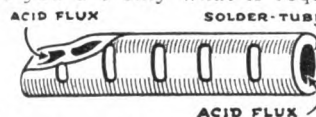
F. W. STEWART
1402 Michigan Ave. CHICAGO



The best shop mechanic you can have this year is KESTER ACID-CORE WIRE SOLDER

There is no waste of time, labor or material when you use this solder. It supplies its own soldering acid which is contained within the solder tube—thus eliminating the trouble of hunting, preparing and applying the soldering flux.

The cells in the seamless tube do away with waste, as you use only what is required.



Kester Acid-Core Wire Solder

is especially adapted to automobile repair work and is used exclusively in hundreds of up-to-date repair shops.

Sold on 1-, 5-, and 10-lb. spools,
or in 1 pound coils.

Order from your jobber or direct



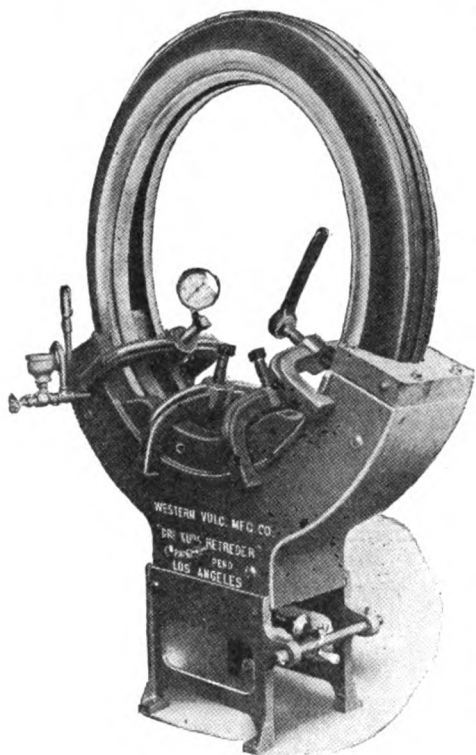
Chicago Solder Co.
CHICAGO - U.S.A.



DRI KURE RETREDER HAS SOME UNUSUAL FEATURES

Several unusual features are claimed for the "Dri Kure Retreder" by the maker, the Western Vulcanizer Manufacturing Company. It is said that this device puts on plain or ribbed tread built up from raw gum, or any kind of non-skid bands so they stay on, stand up and wear. The tires are cured while under pressure of 3,000 pounds to the square inch, hence the treads stay on and wear like new. It permits no steam to come in contact with the wire, and leaves no mould marks.

The makers say that the Dri Kure Retreder does away with shrunken beads, which make the tire hard to put on the rim; stretched beads, which cause the tire to blow off the rim; blown-out beads, due to drying up of the fabric when put in live steam; blown-out beads, in cord tires, due to steam rusting



out the staples, and separation and general deterioration of the fabric body, due to live steam.

Readers wishing to obtain full particulars and trade prices can get them by writing to the Western Vulcanizer Mfg. Company, 150 North Desplains St., Chicago, and mentioning the AMERICAN GARAGE AND AUTO DEALER.

HILL-SMITH MAKES ADDITIONS TO LINE OF AUTOMOTIVE PRODUCTS

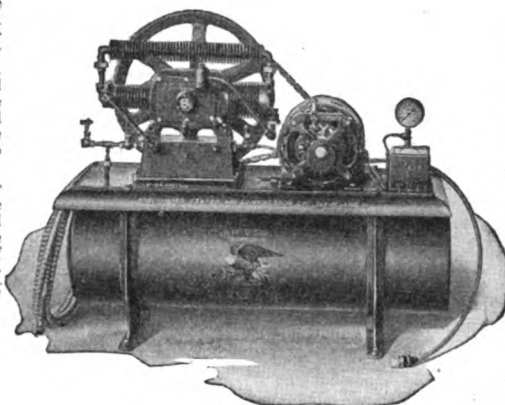
Plans for making a number of new products for use in automobile establishments are being made by the Hill-Smith Mfg. Co., which recently moved its offices from Buffalo to Elmira, N. Y. The Company has taken over the Miller Holst Mfg. Co., and is operating the plant of the Loetzer Valve Mfg. Co., at Monroeton, Pa. The Company is about to issue a new 1919 revised catalogue for distribution in the trade.

USACO TWO-STAGE AIR COMPRESSORS.

The United States Air Compressor Co. of Cleveland manufactures a complete line of air compressors in both two stage and single stage types, comprising twenty different units. These units vary in capacity from 1½ cubic feet to 21 cubic feet per minute and are designed to maintain pressures as high as 500 lbs. The manufacturers call attention particularly to the extreme efficiency obtained by utilizing the two-stage principle.

Every automobile driver realizes that a

compound pump, so-called, gives more efficiency than the single type and it is upon the compound principle that the United States two-stage air compressor is designed.



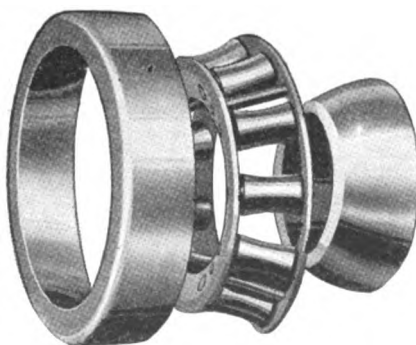
The manufacturers claim that there is less liability for leakage in this type of pump since the first cylinder pumps the air against a low resistance unit, into the second cylinder where it is brought up to the pressure in the tank. In other words, the difference between the atmospheric pressure and that in the tank is divided between the two units. Another advantage gained by this device is that less power is required to drive the small pump than would be required to drive a single switch machine.

Interested garage owners should write for a copy of the new Usaco catalogue which features the complete line of Usaco air compressors. Address inquiries to the U. S. Air Compressor Company, 6542 Carnegie Ave., Cleveland, Ohio.

A Radical Departure in Roller Bearings

Departing from the usual type of roller bearing design the Geo. D. Bailey Co., makers of the Bailey Ball Thrust, have placed on the market a front wheel bearing for Ford and Chevrolet 490's under the name Shafer Roller Bearing that eliminates the chief source of front wheel bearing trouble, namely the inability to take a heavy thrust (sideway) load without damage to the bearing and take care of axle spindle deflection as well.

The outer surface of the inner cone is convex, having the contour of a perfect ball, and the rollers possess a concave surface, thereby forming a cradle as it were for the cone and allowing it to swing to



meet any deflection of the spindle when same gets out of alignment. The cone being free to move with the spindle and the load being taken upon the full length of the rollers causes no strain or binding of bearing itself as in the case of the rollers

of a bearing the cone of which is held perfectly rigid and cannot meet the misalignment or deflection of spindle.

The concave surface of the rollers at all times presents an equal load-carrying surface both from the side as well as the top and therefore the bearing is able to accept thrust (sideway) loads equally as well as radial (downward) loads. This feature in itself is a distinct departure and permanently stops the real source of front wheel bearing trouble.

Calculagraph Prevents Time Disputes on Jobs

Owners of service stations and repair shops who have had disputes with customers over the time required for finishing jobs could avoid some of this trouble if they used a Calculagraph. This device is used in a great many establishments where careful track must be kept on time spent on different jobs.

The Calculagraph records and prints on



cards the elapsed time on jobs. It provides a positive record of the time spent on work, and by showing the time stamped on the job ticket prevents disputes with customers regarding overtime charges on their bills. The device also makes it possible for the repair shop or service station owner to keep close track on the work of his various men.

Readers who desire full particulars and trade prices can obtain them by writing to the Calculagraph Co., Dept. 77, 30 Church St., New York, N. Y., and mentioning the AMERICAN GARAGE & AUTO DEALER.

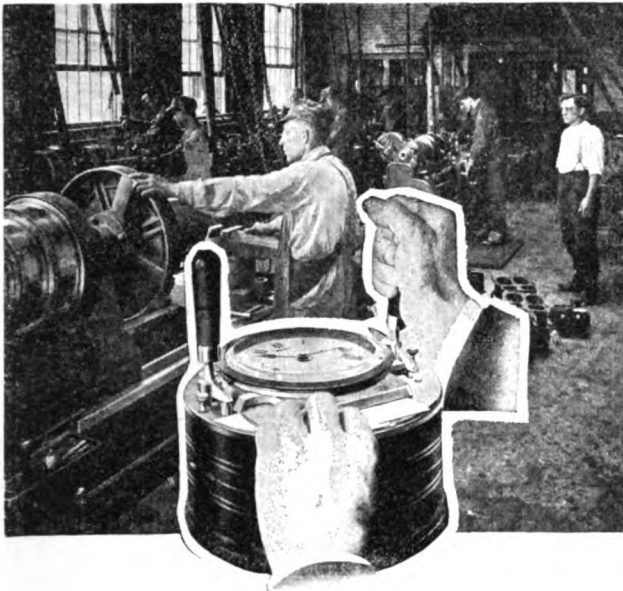
HOW TO MAKE THE SHOP PAY

(Continued from page 30.)

own on the cards that give me a guide as to what to do when there is any bad luck. I have always done that. Ever since I have had charge of men."

"Then I might as well have let you stay home tonight, Bill, for I thought I had something new."

"Nope. Had it all done before you thought of it. Good night, 'Old Efficiency,'" and Bill strutted out.



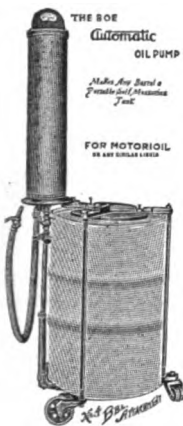
The Calculagraph shows how much time a job takes

thus giving you an accurate basis for repair charges. Its records settle disputes and stop complaints. It will soon pay for itself in your repair shop.

Write today for literature

THE CALCULAGRAPH COMPANY
DEPT. 77, 30 CHURCH STREET, NEW YORK CITY

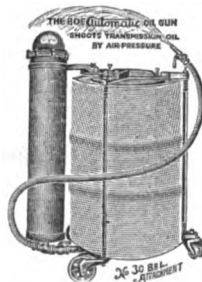
Why Not Make Any BARREL a Portable Self-Measuring TANK?



OUR BARREL ATTACHMENT

truck with steel reinforcing plates for barrel heads and air-pressure solved it.

Dispenses and accurately measures fluid or semi-fluid oil directly from original barrel into oiling system of autos, etc., simply by operator opening a shut-off valve.



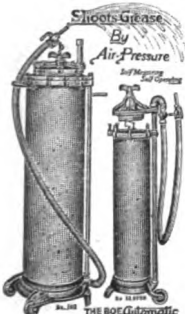
ALSO MANUFACTURERS OF THE WELL KNOWN BOE AUTOMATIC (air pressure, self-measuring) GREASE GUN, 27 lb., 32 lb. and 100 lb. capacity.

Used by thousands of garagemen, also by Uncle Sam and by nearly all leading automobile manufacturers.

For sale by jobbers throughout the U. S. and in foreign countries.

Write us

H. M. BOE COMPANY
2416 University Ave. S. E.
MINNEAPOLIS MINNESOTA



Service

CAR owners will generally estimate the quality of your service by the quality of the product you sell.

Satisfaction to car owners—satisfaction and profit to dealers—that is the ultimate aim of Harvey Service.



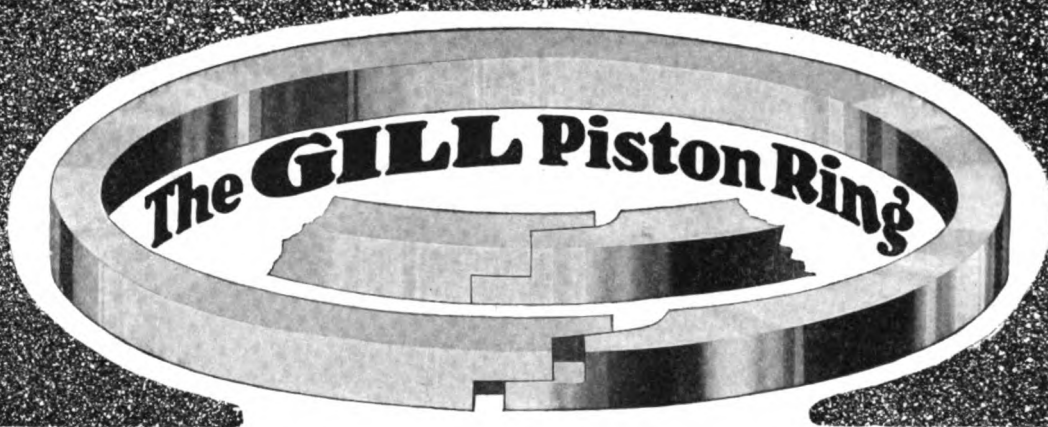
THERE'S A HARVEY JOBBER NEAR YOU

Our new catalogue giving Complete measurements of over 900 Styles of Springs is yours on request

HARVEY SPRING & FORGING CO.

922-17th Street

RACINE, WIS.



PERFECT COMPRESSION

Perfect Compression is required to secure every ounce of power from the gasoline consumed.

The joint of the GILL PISTON RING insures perfect compression and thereby conserves gasoline.

Ask your jobber or write for literature

GILL MANUFACTURING COMPANY

351 West 59th Street

CHICAGO, ILLINOIS

The PERFECT ONE PIECE PISTON RING.

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

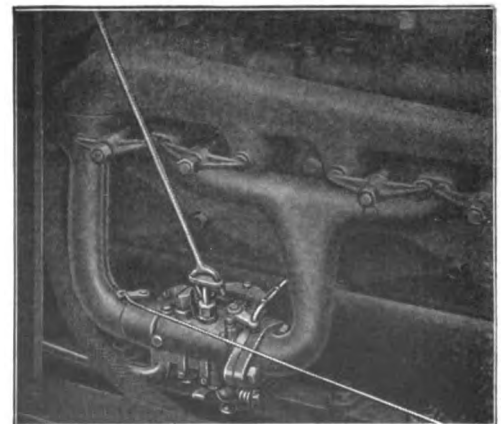
Retails for \$9.00 complete.

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Overland and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

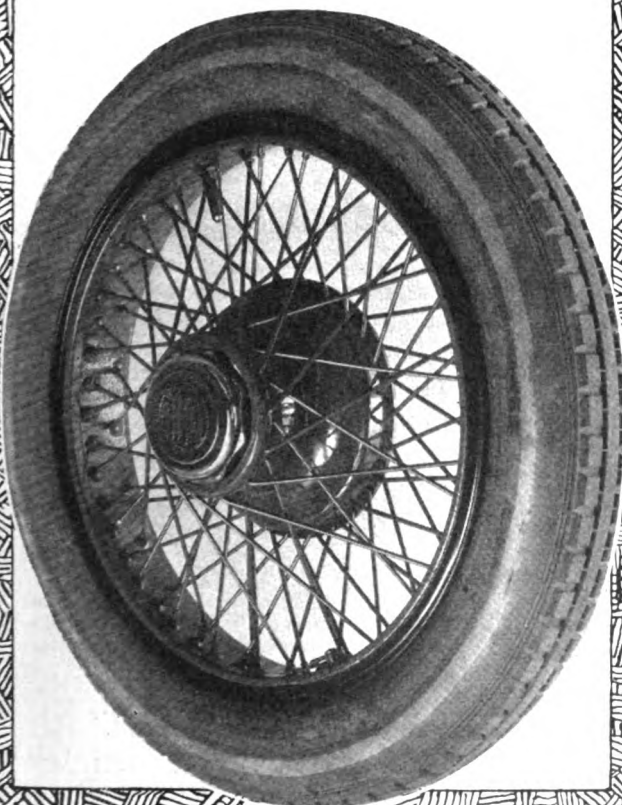
Some Real Reasons for Pasco Superiority

1. **STANDARD WIDTH OF TREAD**, by which PASCO Wire Wheels will replace standard wood wheels, without widening tread of the car—an exclusive PASCO feature. Because of this you can drive your PASCO equipped car over rough and rutty roads without scraping the sides of tires and wheels.
2. **INGENIOUS SPOKE-LACING**, which gives greater curb-clearance than any other wire wheel. No curb can scrape your spokes. This spoke-lacing also gives PASCO the ability to resist shocks, and yet allows an elasticity that gives the maximum riding-comfort.
3. **SURE-LOCK**, by means of which no PASCO wheel can come off a hub while car is in motion. Your insurance against accident.
4. **DEMOUNTABLE FEATURE**, that makes it easily possible to change a PASCO wheel in less than three minutes.
5. **PASCO STRENGTH**, which is at least five times greater than any wood wheel, size for size. The PASCO is trued on a special truing stand and tightening machine. This remarkable apparatus insures uniform balance and the utmost rigidity.

Write for full details, if you are interested in GOOD Wire Wheels.

*DEALERS: Wire or write for
profitable sales-plan.*

NATIONAL WIRE WHEEL WORKS, Inc.
DEPT. G GENEVA, N. Y.
SERVICE STATIONS IN PRINCIPAL CENTERS



National Needs

have made curtailment of rubber imports necessary. Already the excess of demand over supply has caused an increase in tire prices—other increases are imminent.

It's Time Now for Economy

If your heart is in this war, you will clearly see the need of getting the last fraction of a mile out of your tires. You can do so by coupling your patriotism up with

National Tire Filler



Motorists Have No Tire Trouble Who Ride on This Perfect Substitute for Air

Rim-cut-proof, blowout-proof, puncture-proof tires are now a reality. Motoring is now freed from the shackles of tire trouble, and is made safe, comfortable and enjoyable.

National Rubber Tire Filler replaces the inner tube. It has all the resiliency of an air-filled tire with none of its disadvantages. It lasts indefinitely—40,000 miles or more. It has been in use for five years and has conclusively proven its superiority and economy over air-filled tires. Our factory taxed to capacity is proof positive of its great popularity.

**It rides as easy as air.
It cannot puncture or blowout.
It can be used on all style tires.
It doubles tire mileage.
It is easily installed.
It stimulates motoring.**

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Sell readily because their superiority is well known to the Motoring Public

AMPECO PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. AMPECO Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes. We also make the famous AMPECO WHEEL PULLERS and BRAKE SHOES, both one- and two-piece. If your jobber does not handle AMPECO Products, write us direct.

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General Selling Agent for

**American
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Products
Co.**

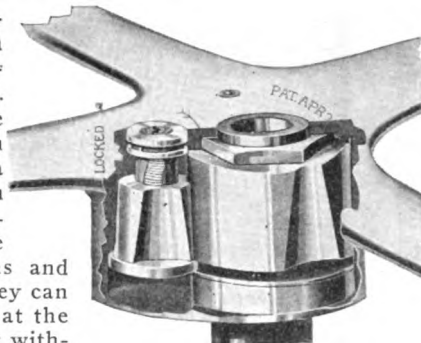
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Iowa



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The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."



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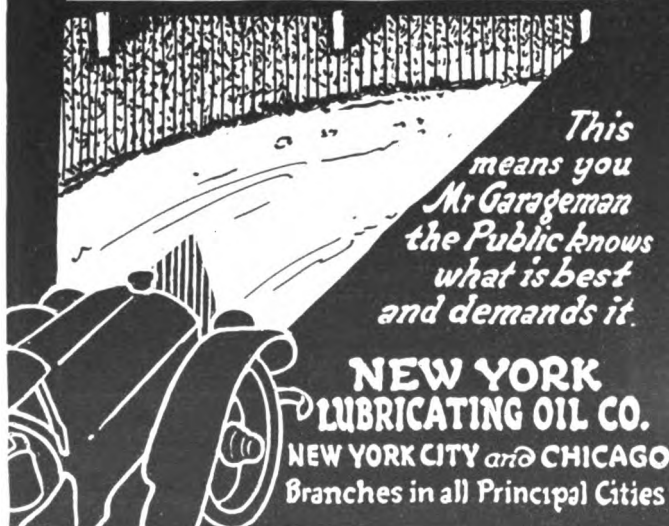
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OILS
& GREASES**
On Sale At Every Garage

*This means you
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the Public knows
what is best
and demands it.*

**NEW YORK
LUBRICATING OIL CO.**
NEW YORK CITY and CHICAGO
Branches in all Principal Cities



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will pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



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Cylinder regrounding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

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products satisfy
service pleases

ROSE



OVER 1,000,000 IN USE

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Hastings Neb
MFGRS

ASK
YOUR
JOBBER

QUALITY

SERVICE



Smooth as the flight of the birds



going South for the Winter is the progress of the Ford equipped with

**W. & C.
Shock Absorbers**

The 200,000 Fords equipped with these Shock Absorbers is adequate proof of their superiority. There are thousands sold every month.

DEALERS: Every Ford owner is a likely prospect for W. & C. Shock Absorbers. The expenditure of \$10.00 adds many times that amount to the life of the car, to say nothing of the comfort afforded.

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The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

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Uncle Sam's Fighting Boys Wear
IRONCLAD KHAKI
(Twill Cloth)

You men and women on the "firing lines" of industry should wear garments of this patriotic economy cloth, too. It's fast color and wears like leather.

**COVERALLS OVERALLS
SHIRTS and PANTS**

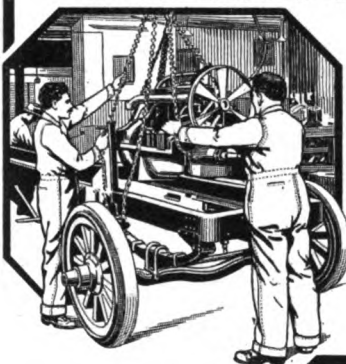
made of the genuine IRONCLAD KHAKI (the kind Uncle Sam uses); carry the yellow "Army label" like the above. LOOK for it and the Guarantee Bond in the garments before you buy.

See for yourself what Ironclad Khaki and Miss Ironclad Khaki, the special woman's overall cloth, look like. Write today for free samples.

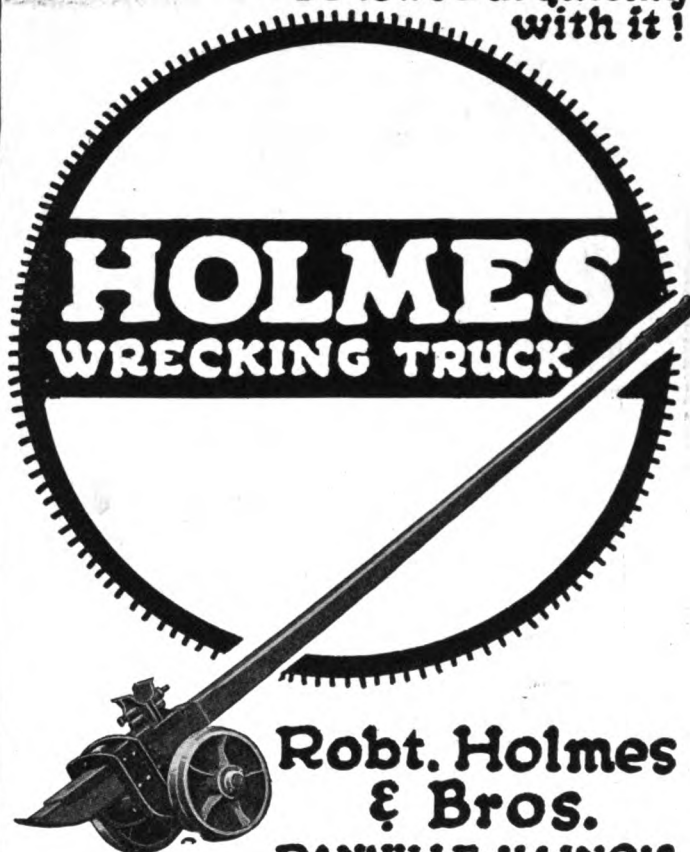
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be towed in quickly
with it!



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& Bros.**
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**Perfect Soldering
is essential to any
repair job**



**NOKORODE
Soldering Paste**

is made with that fact in view. It is compounded with such care that each particle contains every element of the flux. Consequently it produces a perfect, permanent job wherever used.

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Indispensable, around the soldering shop—

Over 5000 mighty bright soldering men say they have learned a lot from

**SOLDERING
KINKS**

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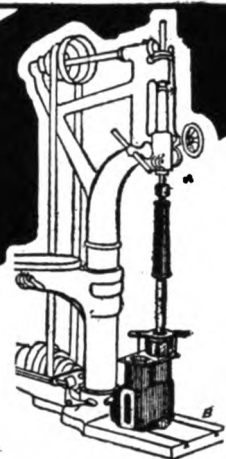
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May we show how profits can be increased.

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CYLINDER REBORING MACHINES



Storm Cylinder Reborbing Machine

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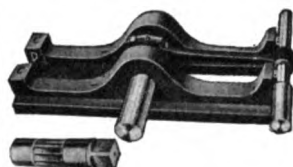
Our line includes the

STORM Cylinder Reborbing Machines
STORM Piston Vise
STORM Valve Port Renewing Outfit
STORM Connecting Rod Bearing Reamer, Jig and Straightening Gauge

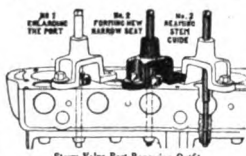
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STORM MFG CO.

1714 4th St. THOMPSON, IOWA



The Storm Connecting Rod Bearing Reamer, Jig and Straightening Gauge



Storm Valve Port Renewing Outfit

Profits

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The demand for service in recharging auto storage batteries is constantly increasing. There are big profits for you all the year round, but cold weather, heavy starter service and excessive use of lights makes battery charging profits run highest when other business runs low. Other garages, with no better opportunity than you, are clearing

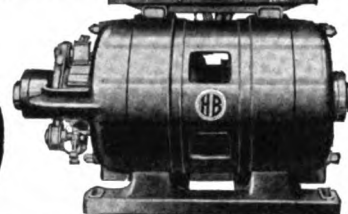
\$100 to \$150 Extra Profit Every Month

Some are doing even better than this. What you can make depends entirely upon yourself. This HB 500-watt Charger will recharge from 1 to 7 batteries at once, with current cost of only 12c to 15c per battery. Autoist pays 75c to \$1.50. Anyone can operate. No electrical or mechanical experience necessary. Will recharge any make or size auto storage battery quickly, successfully and profitably.

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Box G1 TROY, OHIO



One Garage
is averaging
more than
\$200.00
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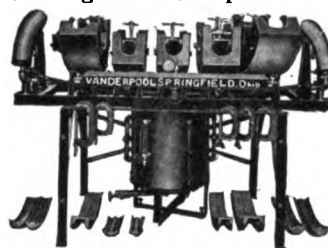


Will produce 90 pounds pressure more easily than you can pump 65 pounds with the ordinary vertical pump, with one-quarter the effort and in half the time. Well made throughout.

Discounts on request
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Repair Hundreds of Tires a Year and Make Big Money

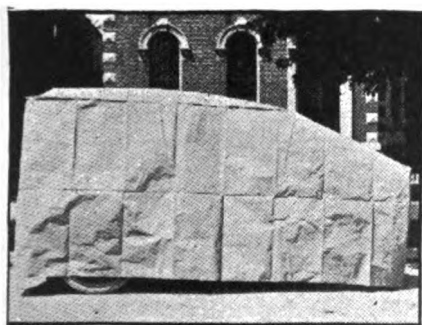
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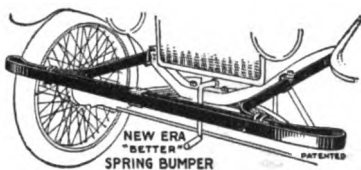
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Are turned from the best Solid Bar Steel and are Heat Treated. For

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They are unexcelled. Ask for dealer's discount.

Price
\$1.50



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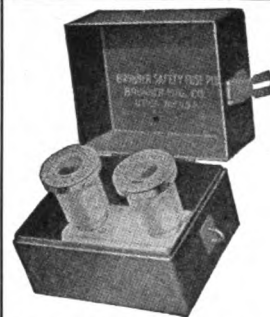
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Write today for full information.

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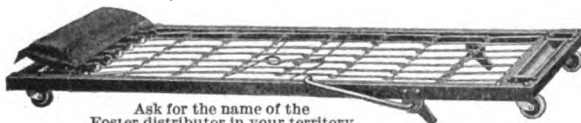
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BURNS OUT BUY A**

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FUSE PLUG**

IT WILL PROTECT YOUR AIR COMPRESSOR
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BRUNNER MFG. CO. UTICA, N. Y.

Price \$4.00

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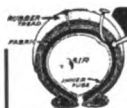
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AN ANCHOR that prevents slipping.
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Messrs. Jessop
and Thompson in
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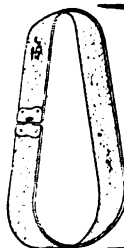
A Page of Opportunities



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Inner armor for automobile tires.
Prevents punctures and blowouts.
Double mileage of any tire, old
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WAGNER AUTO ENGINE CLEANER
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actually saves half the usual repairs. Quick, eco-
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OIL SEALING
PISTON RINGS
NO-LEAK-O
GIVES RESULTS NO
OTHER RING CAN
Every set guaranteed. 7 years success. POPULAR
SIZES 50 cents. If your jobber can't supply you
order direct. P. Post is quick. Write for free booklet.
NO-LEAK-O PISTON RING CO., Baltimore, Md.



BUY

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KEEP ON BUYING

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Lifts the heaviest car with ease—in
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18 inches. 10 1/2-in.
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heavy grease, and
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covered.
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Branch Offices in the Large Cities



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Our revolving cases will prove to be the handiest for you in locating your repair parts, such as bolts, screws, cotter pins, ball bearings, etc.

These cabinets also prevent rust and loss.

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BERMO WELDING PLANTS

are made in many styles. There is one that will just fill your requirements.

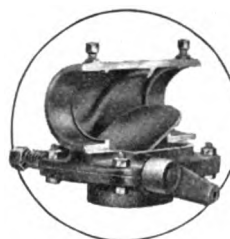
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Write for particulars

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to pay in small installments

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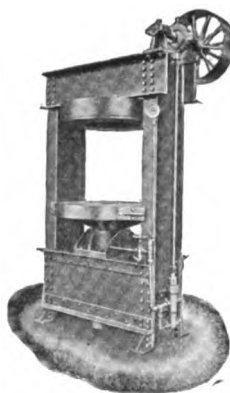


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work easier than any others.

We make many sizes for many purposes.



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50 to 75% Less

than NEW PARTS would cost. Only the best parts sold and backed by an iron-clad guarantee.

Our Guarantee: Absolute satisfaction or money cheerfully refunded. For instant service on parts, write, phone or wire—

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Co. and Sell the Pieces"
13th and Oak Kansas City, Mo.

Cylinder
Regrinding
Pistons
Rings
Pins

WORK, MATERIAL and
ENGINEERING are RIGHT
BUTLER MFG. CO.
1120 E. Georgia Street
INDIANAPOLIS

LOWEST PRICES on Good Serviceable PARTS

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We are the biggest wreckers in the world. The size of our business enables us to undersell all competition.

Money cheerfully refunded if you are not satisfied.

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Correspondence from the trade invited.

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Largest Car Wreckers in the World
1915 So. State St. CHICAGO, ILL.

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SUNDERLAND'S
give satisfaction

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and get it back in 24 hours.

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Index to Advertisements

A

| | |
|-------------------------------|----|
| Adams & Elting | — |
| Advance Automobile Access- | 3 |
| ories Corp. | — |
| American Accessories Co. | 48 |
| American Bolt & Screw Case | 49 |
| Co. | — |
| American Machine Products Co. | 44 |
| American Oil Pump & Tank | — |
| Co., The | — |
| American Technical Society | — |
| Aske Automatic Voltage Regu- | — |
| lator Co. | — |
| Atlas Auto Supply Co. | — |
| Auto Cape Top Co. | 50 |
| Auto Engine Works | 50 |
| Auto Salvage Co. | 50 |
| Auto Spring Repair Co. | 51 |
| Auto Wrecking Co. | 50 |

B

| | |
|-------------------------|-----------|
| Baird Equipment Co. | 49 |
| Bermo Co., A. J. | 49 |
| B. & M. Mfg. Co. | 41 |
| Bee Co., H. M. | 41 |
| Brunner Mfg. Co. | 21 and 48 |
| Buettner Co., Chas. H. | 48 |
| Butler Mfg. Co. | 50 |
| Buttum Tool Co. | — |
| Burgess Mfg. Co., W. S. | — |
|Inside Back Cover | — |

C

| | |
|--------------------------------|----|
| Calculagraph Co. | 41 |
| Cassidy Co., Edward A. | 49 |
| Catlain, Andre G. | 50 |
| Chicago Baling Press Co. | 49 |
| Chicago Solder Co. | 39 |
| Commonwealth Edison Co. | — |
| Curtis Pneumatic Machinery Co. | 19 |

D

| | |
|---------------------------|----|
| Dearborn Truck Co. | — |
| Defender Auto Lock Co. | 5 |
| Denby Motor Truck Co. | 7 |
| Detroit Auto Radiator Co. | 50 |
| Dunton Co., M. W. | 46 |

E

| | |
|----------------------------|----|
| Eccolene Company | — |
| Elgin Motor Car Corp. | 25 |
| Ever-Tight Piston Ring Co. | 4 |

F

| | |
|--------------------------------|------------|
| Federal Sign System (Electric) | — |
| Flexlume Sign Co. | Back Cover |
| Forbes, J. P. | — |
| Foster Bros. Mfg. Co. | 48 |
| Franklin Mfg. Co. | 46 |

G

| | |
|---------------------------|----|
| Ganschow Co., William | 45 |
| Garden City Spring Works | 51 |
| Gill Mfg. Co. | 42 |
| Globe Mfg. Co. | 35 |
| Graham Roller Bearing Co. | — |
| The | — |
| Greer College of Motoring | 48 |

H

| | |
|------------------------------|----|
| Haney & Co., J. H. | 45 |
| Harton & Co., Inc., Thos. J. | — |
| Harvey Spring & Forging Co. | 41 |
| Hobart Bros. | 47 |
| Holmes & Bros., Inc., Robert | 46 |
| Hooven Radiator Co. | — |
| Howell Co., The W. H. | 47 |

I

| | |
|-------------------------|---|
| Inland Machine Works | — |
|Inside Front Cover | — |

J

| | |
|---------------------------|----|
| Jenkins Vulcan Spring Co. | 31 |
| Jorgensen Mfg. Co. | — |

K

| | |
|-----------------------------|----|
| Kennedy Car Liner & Bag Co. | 47 |
| Kimball Tire & Rubber Co. | — |

L

| | |
|--------------------|----|
| Lawrence & Co., L. | 50 |
| Lourie Mfg. Co. | 49 |

M

| | |
|--------------------------|----|
| McDaniel Rubber Co., Leo | — |
| Malbohm Wagon Co. | — |
| Marnion Chicago Co. | 54 |
| Marvel Carburetor Co. | 42 |
| Marvel Machinery Co. | 27 |
| Mechanical Belt Co. | 19 |
| Miami Trailer Co. | 4 |

N

| | |
|------------------------------|----|
| National Cash Register Co. | 37 |
| National Rubber Filler Co. | 43 |
| National Wire Wheel Works | 43 |
| New Era Spring and Specialty | — |
| Co. | 48 |
| New York Coil Co. | 51 |
| New York Lubricating Oil Co. | 41 |
| No-Leak-O Piston Ring Co. | 48 |
| Norma Company of America, | — |
| The | 6 |

P

| | |
|--------------------------|----|
| Paro, H. G., Co. | — |
| Phillips Engineering Co. | 48 |
| Ponderick Bros. | 44 |
| Pruyn Ball Bearing Works | — |

R

| | |
|-----------------|----|
| Reliance Co. | 44 |
| Romort Mfg. Co. | 33 |

S

| | |
|-----------------------------|----|
| St. Paul Welding & Mfg. Co. | 50 |
| Schaler Co., C. A. | — |
|Front Cover and | 23 |
| Schrader's Son, Inc., A. | 29 |
| Spencer's Sons, I. S. | 48 |
| Sprague Mfg. Co., E. H. | — |
| States Chemical Co. | 8 |
| Stewart, F. W. | 39 |
| Storm Mfg. Co. | 47 |
| Sturr-Bullard Motor Co. | — |
| Sunderland Machinery & Sup- | — |
| ply Co. | 50 |

T

| | |
|-------------------|---|
| Tractor-Train Co. | — |
| Tungsten Mfg. Co. | — |

U

| | |
|----------------------------|----|
| Universal Mfg. & Sales Co. | 51 |
| U. S. Air Compressor Co. | 53 |

V

| | |
|--------------------------------|----|
| Vanderpool Vulcanizing Co. | 47 |
| Visible Gasoline Dispenser Co. | — |

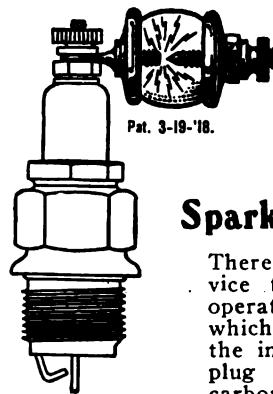
W

| | |
|------------------------------|----|
| Wagner Specialty Co. | 48 |
| Warshawsky & Co. | 50 |
| Webber & Co., P. H. | 45 |
| Western Electric Co. | — |
| Weston Electrical Instrument | 49 |
| Co. | — |

Z

| | |
|-----------|----|
| Zinke Co. | 33 |
|-----------|----|

Spark Plug Troubles Are Rare Occurrences



On the Car
Equipped With

UNIVERSAL or MARVEL

Spark Plug Intensifiers

There is a big demand for a device that insures satisfactory operation from spark plugs which are worn out or on which the insulation is broken; or a plug fouled with grease or carbon.

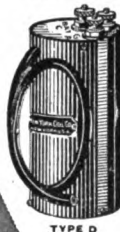
These INTENSIFIERS will make such plugs fire perfectly. They indicate instantly whether a cylinder is missing and whether the ignition system is in perfect order. They give the spark more energy—producing more power and a smooth running motor. They eliminate carbon, waste of gas, cleaning the plugs and guessing which cylinder is missing.

Every one of your customers will want them

JOBBERs and DEALERs—Your profit's liberal.
Write today for our attractive proposition

UNIVERSAL MFG. AND SALES CO.
552 W. Harrison St. - - - Chicago, Ill.

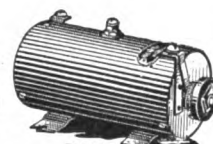
NEW YORK REPLACEMENT COILS AND RESISTANCE UNITS



Service Stations
AND
Garagemen



Handsome profit and satisfied customers are yours by installing our full line of Replacement Coils for all Battery Equipped Cars. Circular gives full details.

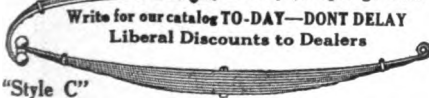


Western Distributors:
Gray-Heath Co., 1440 Michigan Ave., Chicago, Ill.

NEW YORK COIL COMPANY
338 PEARL ST. NEW YORK CITY

GUARANTEED SPRINGS CARRIED IN STOCK FOR ALL MAKES OF CARS

For QUICK and SATISFACTORY SERVICE
order your springs from



"Style C"

**AUTO SPRING
REPAIR CO.**

1331 W. Jackson Blvd.
CHICAGO, ILL.

**AUTOMOBILE
SPRINGS**
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

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The M. W. Dunton Co., Providence, R. I. (Radiator Cure.)
New Era Spring and Specialty Co., Grand Rapids, Mich.

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Curtis Pneumatic Machinery Co., 1515 Kienlen Ave., St. Louis, Mo.
Globe Mfg. Co., Battle Creek, Mich.
U. S. Air Compressor Co., 6542 Carnegie Ave., Cleveland, O.

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AUTOMOBILE TRAILERS

Miami Trailer Co., Troy, Miami Co., Ohio.

AUTOMOBILE WHEELS

National Wire Wheel Works, Geneva, N. Y.

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Pruyn Ball Bearing Works, 1919 Michigan Ave., Chicago.
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Phillips Engineering Co., Dayton, Ohio.

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New Era Spring & Specialty Co., 1152 Hamilton Ave., Grand Rapids, Mich.

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Pruyn Ball Bearing Works, 1919 Michigan Ave., Chicago.

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Honorably Discharged with An Admirable Record

Usaco
AIR COMPRESSORS
TRADE MARK

The USACO Two Stage De Luxe Automatic Air Unit

Through inherent high quality alone this compressor has commanded respect for years and found its way into a majority of the better garages, tire shops and filling stations. It is exceptionally quiet in operation, capable of delivering the highest pressure ever required and so constructed as to render service indefinitely.

Each season the De Luxe has grown in popularity, but the changing conditions now apparent make the use of this unit not only more desirable but almost imperative. Tires are now in use of such size and pressure as were not thought of two or three years ago. To meet these unusual conditions requires an **un-usual** compressor. The De Luxe is the one ideal unit available. Send for literature and judge for yourself.

HAVING fulfilled our obligations to the Government in supplying hundreds of **Usaco** Two Stage Automatic Air Compressors for war service here and abroad, our entire organization is again on a peace basis, ready to afford the best of attention to regular requirements.

Being designed originally for the most severe service known, it was natural that **Usaco** Two Stage Compressors should have passed the exacting tests and measured up to the high ideals of the War Department without change in design.

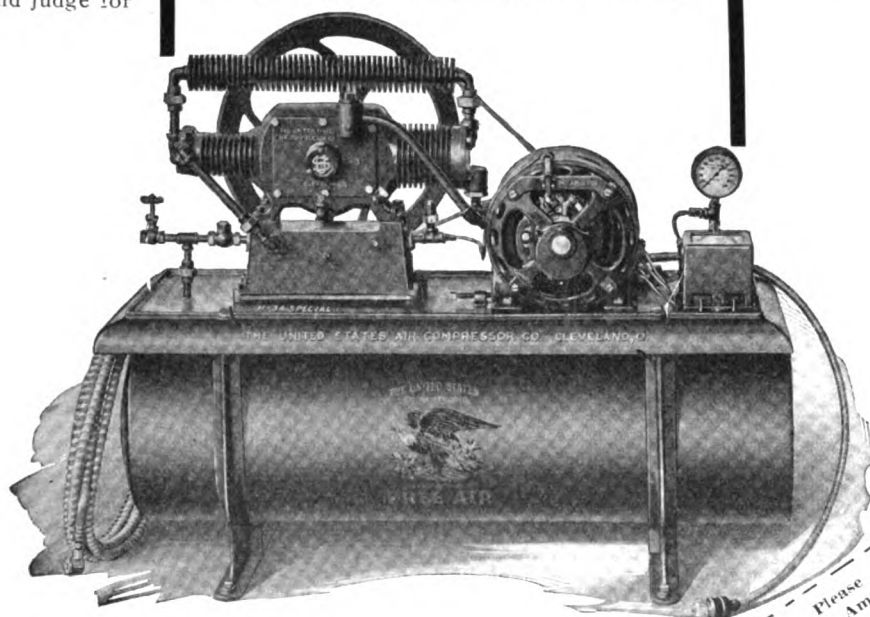
In war seconds count—there is no time to await the slow, painful efforts of inefficient compressors. Under such conditions the tendency is to "under inflate," with its high toll of tire destruction. By furnishing instant high pressure service, **Usaco** Two Stage Compressors avoided these serious features and undoubtedly saved thousands of dollars.

The USACO Line of Air Compressors

The **Usaco** Line of Air Compressors comprises different numbers in Two Stage and Single Stage types and various individual units adapted for forming combination of almost unlimited kinds and capacities.

Each machine is designed to fill a particular need and it will perform that service in a manner that is never excelled and seldom equalled.

The **Usaco** Guarantee is the strongest ever applied to air compressors—and absolute protection to purchasers.



Please send literature advertised in American Garage and Auto Dealer to name written in margin.

The United States Air Compressor Co.

6542 Carnegie Avenue

Cleveland, Ohio

Brings the City to the Farm

Silent Chain Drive

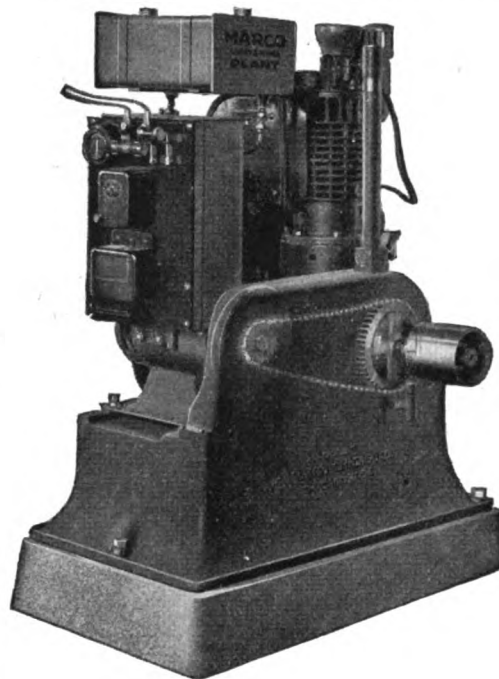
18 to 20 per cent more power and range. Simple to operate.

Automatic Control Unit

No meters, rheostat, or regulating. Automatic charging.

Generator

18 to 20 per cent more efficient than average.



Built for U. S.

Designed and built for U. S. Government. Used by A. E. F. in France.

Single Base Unit

Everything on one base. Engine removed in five minutes.

Self Starter

Just push the button.

Dealers! See the New Electrical Plant

For Farm, Garage, Church, School and Village Use

The Great War has produced great achievements and out of its tremendous demands have come mechanical developments that mark new eras. Foremost among them is the Marco Chain Drive Dual-Power Plant, an entirely new and distinctive type, proven under the gruelling conditions of warfare, to excel anything known to date.

The Marco was developed for the American Army in France and adopted after terrific use which continued through the war. It is the kind of great new development that supplants older types, for the old can never compete with the new.

The Marco will be a feature at the Chicago Automobile Show, January 25th to February 1st. Come to Space 84, Coliseum Gallery.

See it, and you see the machine that marks a new era in farm work and farm life. See it in operation, and you see the new era beginning. SEE the Marco—by all means. It's a revelation—and a revolution. It will be distributed through exclusive agencies. First comers get first consideration.

Chain Drive

The Marco Silent Chain Drive is the adaptation of the automobile principle to the farm power engine. After years of experience the Silent Chain Drive has been adopted by all automotive engineers. No belt slippage, no loss of power in transmission. Unlike the Direct-Connected type, can be driven at any speed with satisfaction and minimum wear and tear. Lasts a lifetime. Childishly simple to operate.

Description

The Marco Dual-Power plant is a full four horsepower, single cylinder, air-cooled type and will drive the Marco 1250 watt generator with an overload capacity up to 2000 watts, without any strain on the engine. It is a slow speed engine (800 R.P.M.), perfectly lubricated. Positive blast Sirocco fan, guaranteed to keep cool in any climate.

Write for Confidential Exclusive Proposition

Dual Power

The Marco supplies both kerosene engine power and electric power. It will supply light and run the stationary machinery on the place either electrically or by direct power, whichever is handiest and most practical. It can be removed from its base in five minutes, mounted on field machinery and sent into the field to operate binders, diggers, spreaders, etc. Has a Bosch magneto ignition so that it is always ready for field work. No other plan has such adaptability and range of use.

Extra Capacity

The Marco is built in anticipation of the farmer's increasing power requirements. Extra capacity of 25 per cent enables the Marco to handle small, moderate, or exceptionally large capacity of current. All that is needed is an increase in size of batteries. Hence plant is made in two models. Engine and generator the same in each—only the batteries are changed.

Model 1... 85-20 watt lights
Model 2... 100-20 watt lights

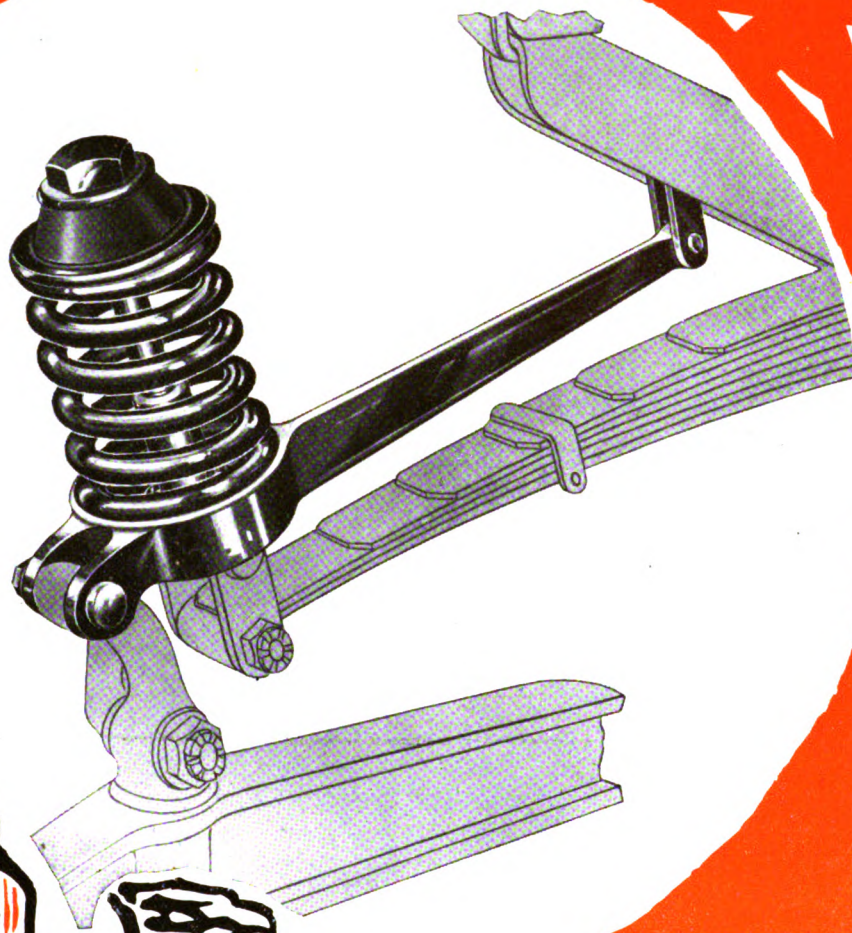
MARCO LIGHT & POWER PLANT

Unit Control! The Marco Patented Unit Control gives a positive taper and automatic control of current in charging batteries. As each cell is charged the current tapers off until all are equally charged. The flow of current is automatically reduced and the batteries cannot be injured by over-charging. No over-loading of generator no burning out of lights, fuses or equipment. No puzzling regulating devices. Utmost simplicity.

THE MARMON CHICAGO COMPANY, 2430 South Michigan Avenue, Chicago

Space 84, Coliseum Gallery, Chicago Automobile Show, January 25th to February 1st

(1)



BURGESS SHOCK ABSORBERS pile up profits for live dealers

THE profits derived from the sale of an auto accessory are not a matter of percentage; they are dependent upon the easy sale and permanent satisfaction of the buyer.

You do not have to sell every set of BURGESS Shock Absorbers that crosses your counter; you need only sell

an occasional set to the man who has not seen them before and in the satisfaction of their service and efficiency he will send in his friends.

There is a multitude of reasons why the BURGESS is Best.

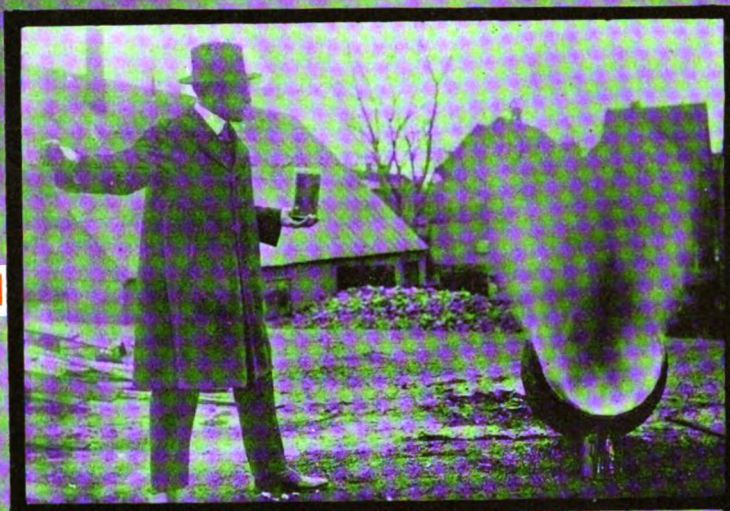
If you have not learned from experience write us for details or, better still, let us send you a sample set that will prove their superiority to dealer and user.

MANUFACTURED BY

The Walter S. Burgess Mfg. Company

SALES DEPARTMENT

THE ZINKE COMPANY, 1323 S. Michigan Ave., Chicago, Ill.



This Is The Way FIRE-CHOKE Acts On Flames

A LARGE quantity of dried paint drippings was placed in the barrel, gasoline sprinkled over the whole interior surface, then the match was applied.

The flames belched out just as the picture shows, only more fiercely.

One handful of Fire-Choke was thrown in and the second picture shows the result. Fire's out.

Fire-Choke acts just the same way when applied to a burning car. It is a dry chemical which instantly changes to great quantities of gas when it comes in contact with fire, smothering the blaze.

It is simply thrown from the hand into the flames. Fire chiefs say it is the best of all chemical extinguishers because it puts out more fire than the others; the gas it forms and the chemical itself are harmless, and do not injure the materials they come in contact with.

Dealers Wanted

There is a splendid chance for dealers to be first in their territories with Fire-Choke. Write for full particulars.

PUT UP IN TWO SIZES
RETAILING AT \$3.50 and \$5.00

THE FLEXLUME SIGN CO.

(Sole Distributors)

NIAGARA STREET and AUBURN AVE., BUFFALO, N.Y.

AMERICAN GARAGE & AUTO DEALER

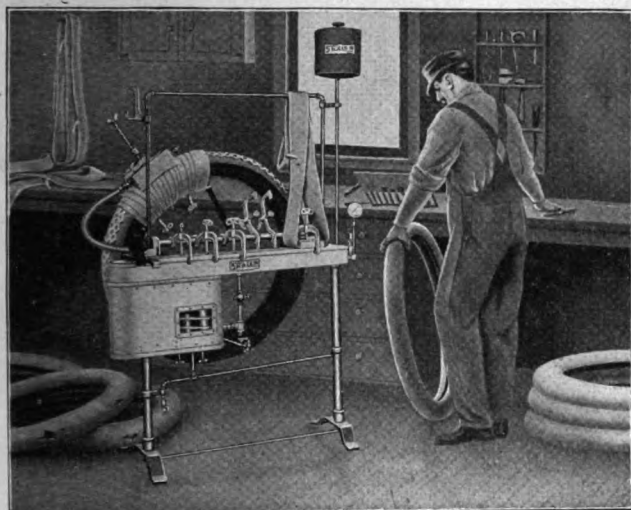


Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

FEBRUARY

1919

Vol. 19 -- No. 2
10 Cents the Copy
\$1.00 Per Year



Make Money Now Repairing Tires

The increasing cost and limited supply of tires makes it necessary for motorists to conserve their casings and tubes — to get the maximum mileage. Present conditions offer tire repair men a big opportunity to make money. Experienced help is not necessary. A boy can learn how to make perfect tire repairs in 30 minutes. Every car owner in your town is a possible customer. Jobs are plentiful because tires blow out and puncture every day. Motorists are willing to pay liberal prices for repairing punctures, blow-outs, cuts, tears, rim cracks, etc.

SHALER

Steam Vulcanizer for Repair Shops

Is the Only One That Has Automatic Heat Control

Will do as much and as perfect work as the large, expensive vulcanizing outfits which cost from \$250 to \$500. The price of this Complete Steam Vulcanizing Plant—heated with either gas or gasoline—is remarkably low—\$70 subject to Trade Discounts. Outfit shown above is Type N. P. R.—No. 41—other models heated by steam or electricity are described in our catalog.

It is portable—easily moved to any part of the shop—occupies but little floor space—a boy can operate it easily and make perfect repairs. The Shaler Patented System of Automatic Heat Control regulates it automatically. It must vulcanize just right. Can't overcure or undercure, and requires no watching or regulating. Large capacity. Repairs 12 casings and 200 tubes a day. Handles any style or size of tube or casing.

The Shaler Wrapped Tread Method of Tire Repairing


is used by all tire manufacturers. It mends casings and tubes quicker, better and at less cost. We furnish Complete Instructions with each outfit. So simple that anyone can do perfect work.

Ask Your Jobber—or Write for Catalog

of the Complete Line of Shaler Vulcanizers
for Repair Shops, Garages and motorists' use

C. A. Shaler Company, 351 Fourth St., Waupun, Wis., U. S. A.

(Oldest and Largest Manufacturers of Vulcanizers)



Rolling right along. 3,000,000 now in use

In both standing and sales, the Inland Piston Ring is fast taking front rank the world over, because it *solved* the problem of making a *one-piece* ring *completely* gas-tight.

The Inland Spiral Cut principle is an exclusive Inland patent—its advantages cannot be duplicated in any other piston ring at any price.

As a mechanically perfect piston ring, the Inland is emphatically the best piston ring proposition for both dealers and engine owners.

Merit, plus advertising on the broadest scale, has made Inland sales grow by leaps. Sales are now on a basis of *millions per annum*.

Inland Machine Works,
817 Mound St., St. Louis, Mo., U. S. A.

*Jobbers everywhere
stock Inlands.*



1 PIECE PISTON RING

Cork Insert

Transmission
Lining for
FORDS



\$3.00

per set of three

Rockies West \$3.25; Canadian \$4.50

*Easy to identify by
the red and black box*

Makes Fords Work Smoother

**Put Cork Inserts on YOUR Ford
and it will act like a different car**

You will miss that noise and jerk when you start, and the jumping and chattering when you stop. You will find the brake sure. You won't have to step on it so hard. As the weeks go by you will find no let up in the smooth action of your Ford. Cork Insert will wear as long as several ordinary sets and give you smooth service to the last mile. As the months pass, you will find you are saving more than half the usual replacement expense, and that the repairman seldom has you for a customer. Cork Insert saves the Ford rear end—the most frequent trouble region.

All Jobbers Handle Cork Insert Transmission Lining—a Sure Repeater—and a Real Business Builder

Cork Insert makes boosting customers.

That's what you want, dealers

When you satisfy your trade, they recommend you, and your business grows. Cork Insert is the most satisfactory transmission lining for Fords. Nothing else equals it for smoothness of operation or economy. Every sale makes you a friend as well as a profit. And here's something to talk about. Cork Insert is produced by a company that's in business to stay and has built up a reputation of **STANDING BACK OF THE DEALER IN EVERY WAY, SHAPE and MANNER.** Cork Insert is advertised more persistently and continuously than any other accessory in the whole field.

ADVANCE AUTOMOBILE ACCESSORIES CORP., Dept. B-7, 56 E. Randolph St., CHICAGO

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Miami

There are some people right now who want **MIAMI TRAILERS** in **YOUR** territory

The trailer demonstrated its value in wartime, and is proving a great money saver in time of peace. Doubling the capacity of a motor truck appeals to every truck user.

In every community there are manufacturers, merchants, cartage companies, and many others that can save money by the use of serviceable trailers.

The MIAMI TRAILER is built for automobile speed over all kinds of roads. A special shock absorbing draw-bar relieves all strain on the car or truck. Made in a variety of styles, embracing every purpose.

Write today for particulars. We will show you how to locate and sell the prospects in your territory.

The Miami Trailer Company
TROY (Miami County) OHIO

Trailers

Ever-Tyte Bill Says:-

I'm breakin into Seeleck Sassiety—Did any of you fellers ever hear tell of Archimmydees?—Neither did I—til last night a guy springs 'it on me—The way I gets it this here Archimmydees was born about too thousan yeers ago and he was some wise Gazook when it came to figgerin and inventin things—NOW GET THIS AND LET IT SINK DEEP—this bird figgered that the only way you could make a circel bigger and keep it near a perfect circel was by thiridin it—the cuts bein the same distanc a part—AND NO GUY HAS EVER BEEN ABEL TO SHOW HE WAS WRONG—Now—heres where we com in—**EVER-TYTE** PISTEN RINGS ARE MADE JUS THAT WAY—THATS THE REESON THEYRE BETTER—THERE BUILT ON THE FIGGERIN OF A GUY WHO WAS SO WISE THAT FELLERS FOR TOO THOUSAN YEERS HAVEN'T BEEN ABEL TO SHOW HE WAS WRONG—There will be guys in 2919 still tryin to out figger us on **Ever-Tytes**, But it can't be did—Theyre made right—Try em now.



Have you a "**Piston Ring Primer**" in your pocket? It has 16 pages of valuable information. Free to you.

figger us on **Ever-Tytes**, But it can't be did—Theyre made right—Try em now.

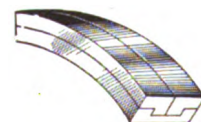
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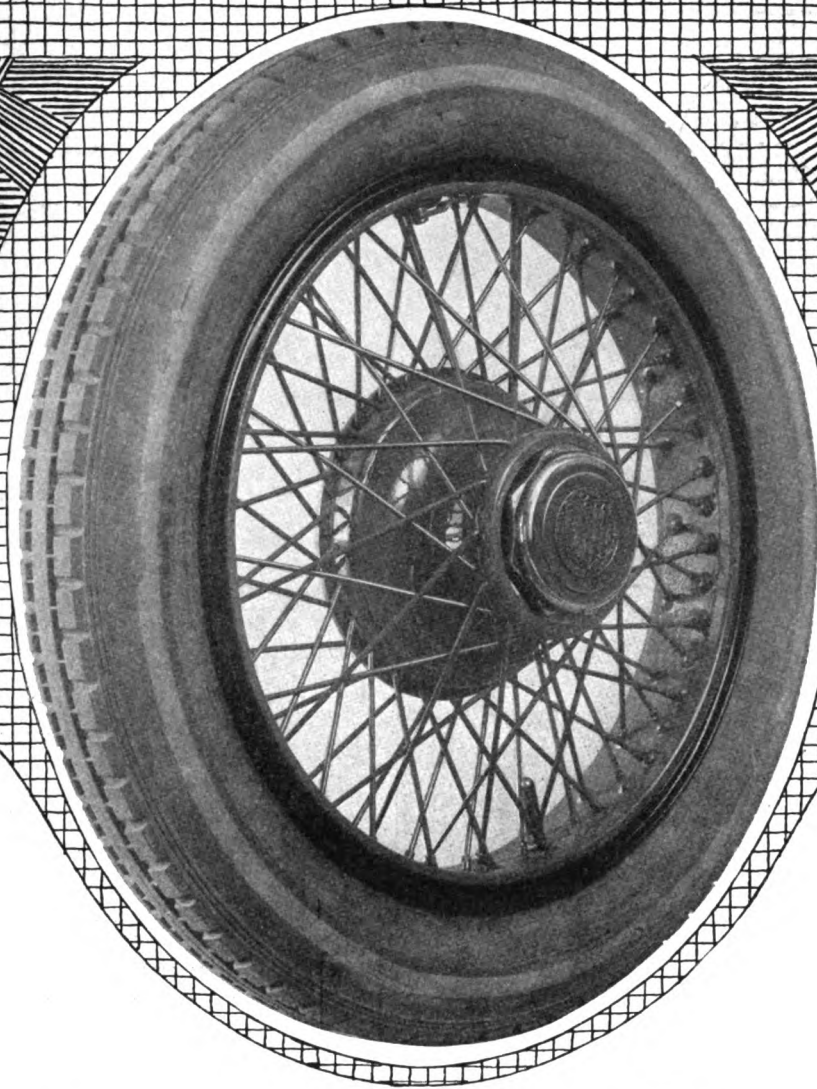
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RIGHT ANGLE
INTERLOCK



Still another reason for PASCO superiority

PASCO wire wheels are now RUST-PROOF. By means of a recent discovery, every bit of metal is treated in this ingenious process before enameling takes place. At last the worst foe of metal—CORROSION—is overcome, and the PASCO wheel becomes practically indestructible. A big step indeed, toward perfection in wire wheels.

SOME OTHER REAL ADVANTAGES

STANDARD WIDTH of TREAD, by which PASCO Wire Wheels will replace standard wood wheels without widening tread of the car—an exclusive PASCO feature. Because of this you can drive your PASCO-equipped car over rough and rutty roads, without scraping the sides of tires and wheels.

INGENIOUS SPOKE-LACING, which gives greater curb clearance than any other wire wheel. No curb can scrape your spokes. This spoke-lacing also gives PASCO the ability to resist shocks, and yet allows an elasticity that gives the maximum riding comfort.

SURE-LOCK, by means of which no PASCO wheel

can come off a hub while car is in motion. Your insurance against accident.

DEMOUNTABLE FEATURE, that makes it easily possible to change a PASCO wheel in less than three minutes.

PASCO STRENGTH, which is at least five times greater than any wood wheel, size for size. The PASCO is trued on a special truing stand and tightening machine. This remarkable apparatus insures uniform balance and the utmost rigidity.

Write for full details if you are interested in GOOD Wire Wheels.

DEALERS: Wire or write for profitable sales plan.

NATIONAL WIRE WHEEL WORKS, INC., Dept. G., GENEVA, N. Y.
SERVICE STATIONS IN MOST OF THE PRINCIPAL CENTERS



"NORMA" PRECISION BALL BEARINGS

(PATENTED)

To attain leadership is an achievement—to maintain it in face of competition is a greater achievement still. And what folly can be greater than that which hazards a leadership by a short-sighted sacrifice of even one of the so-called minor details upon which achievement has been built? A business structure built through the years may be destroyed in a day.

The proved super-service qualities of "NORMA" Precision Bearings, revealed in the records of hundreds of thousands of super-service ignition and lighting apparatus the world over, have beyond question been vitally contributive to the consistent performance of these equipments.

**Be Sure—See That Your
Electrical Apparatus
is "NORMA" Equipped.**

THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings.



AMERICAN GARAGE & AUTO DEALER

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|--------------------------------|-------|
| Shows Surpass All Records..... | 18 |
| Looking Forward | 18 |
| Push Highway Improvement | 18 |
| Cash Chases Cleanliness | 18-19 |

GENERAL

| | |
|--|-------|
| NEXT! | 9 |
| Dealer Shows Succeed; Breaking Old Records..... | 10 |
| Minneapolis Show Needs Greater Exhibition Space.. | 10 |
| State Dealers Flock to Milwaukee Show..... | 10 |
| Bristol Show to be Run by Chamber of Commerce... | 10 |
| Omaha Tradesmen Win Strong Support for Show.... | 11 |
| "Prove It Yourself" Plan to Market Fire-Choke..... | 11 |
| Dealers Hold Annual Meeting; Re-elect Vesper as President | 12-13 |
| Jobbers Freed of Charge of Restraining Trade..... | 13 |
| Colorado Man Chosen for National Good Roads Post Truck Prices Not to be Lower After War, But May Increase | 14 |
| Tank for Madison Show | 14 |
| "Sell the Functions" Is Keynote of Four Days' Sales Convention | 15 |
| President Wilson Favors Road Construction Work... | 15 |
| NEXT! | 16-17 |
| One Price and Good Service Win for Colorado Dealers Only Two Weeks Left to Enter for Sales Idea Contest Prizes | 19 |
| Motor Truck Board Is Organized by the A. A. A. | 19 |
| F. C. H. Troesch to Export American Tire Products.. | 20 |
| Acason Firm Announces New One-Ton Motor Truck... | 22 |
| New York Girl Succeeds Selling Motor Trucks..... | 22 |
| Manufacturer-Dealer Helps | 24 |
| Bergie National Spark Plug Co..... | 24 |
| Waxit Mfg. Co. | 24 |
| Buffalo Specialties Co. | 24 |
| Window Displays Win Profits and Cost Little to Arrange | 26 |
| Crippled Soldiers Are Trained to Work as Motor Mechanics | 30 |
| Penlings from the Pen of Dike..... | 30 |
| Standex System Designed to Save Lubricating Oil.. | 32 |
| The Small Town Post-War Market | 32 |
| Automotive Dealers Take Tractors to the Farmer.... | 34 |
| Fifty Millions for Roads Now Proposed in Iowa.... | 34 |
| Sprague Tire Company Plant in Production..... | 34 |
| Tractor Trade Attracts Automobile Distributors..... | 36 |
| Attractive Signs Lead Trade to Dealer's Door..... | 42 |
| Calendar of Events | 42 |

DEPARTMENTS

| | |
|---------------------------------------|-------|
| In the Tire World | 20 |
| In the Truck and Trailer Field..... | 22 |
| Welding, Cutting and Brasing | 28 |
| Tractors and Farm Lighting | 36 |
| Accessories and Garage Equipment..... | 38-40 |
| Buyers' Reference | 52 |
| Index to Advertisers | 51 |

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E. T. CLISSOLD, Vice President S. R. EDWARDS, Secretary

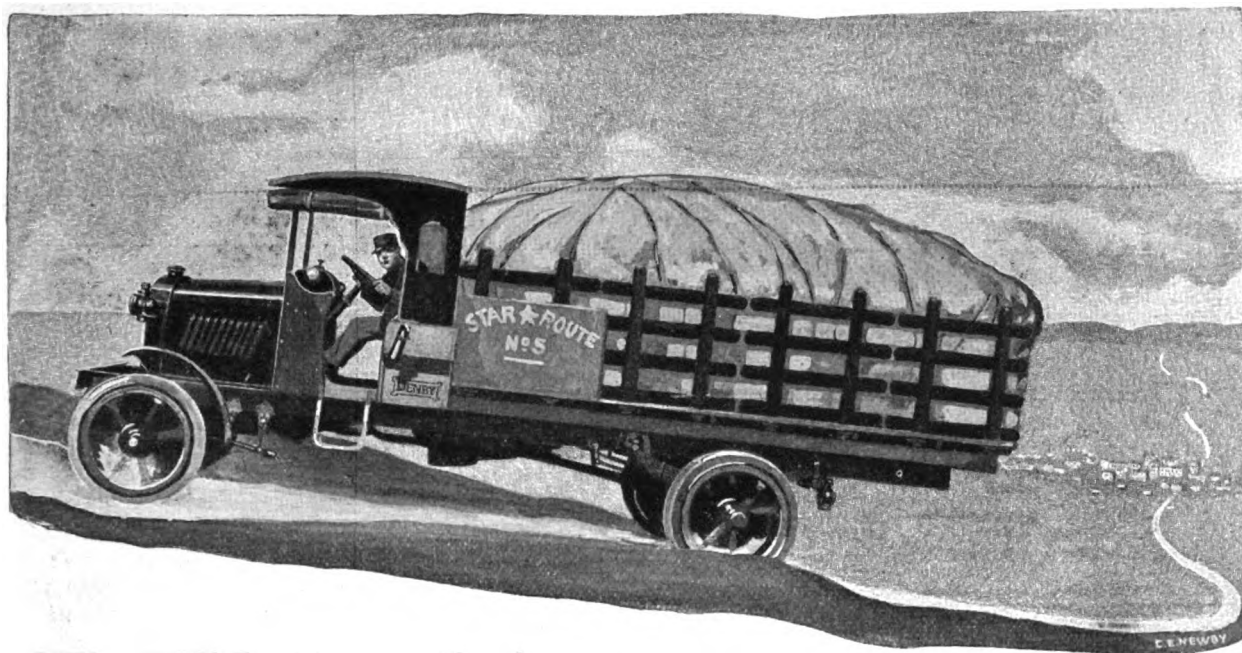
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DENBY MOTOR TRUCKS

*Pioneers of the
Internal Gear Drive*

For City Streets or Mountain Trail

This new 3½ ton truck, like all the other Denby models, is built to meet the hardest conditions of service it may be called upon to face. The most rigid tests to which a new truck has been put, proved its ability.

This unusually high standard of performance, to which every Denby must measure, is the basic reason for their unvarying dependability in urban, interurban or rural work.

| | | |
|--------|---|--------|
| 1 Ton | - | \$1650 |
| 2 Ton | - | 2350 |
| 2½ Ton | - | 3000 |
| 3½ Ton | - | 4150 |
| 5 Ton | - | 4900 |

The wide range of sizes gives the Denby owner a truck exactly suited to his needs—and provides for the Denby dealer, a line that meets every demand of transportation.

Denby Motor Truck Company, Detroit



Window Display of I. J. Cooper Rubber Co., Cincinnati, O.

It will mean a whole lot to you financially to be a TIRE-DOH dealer:

TIRE-DOH is so valuable to the motorist he simply has to have it. This compound makes it easy for anyone to repair the average puncture in a very few minutes. No heat, no tools, no expensive vulcanizing, no expert needed—the car owner makes his TIRE-DOH repairs himself. Just the thing for the following repairs:

Inner Tube Puncture
Torn Out Valve Stems
Inner Tube Blow-outs

Inner Tube Splicing
Inner Tube Rips
Cuts in Casings
Tears, Holes, and Cuts

Motor Cycle Tire Troubles
Blisters in Casings
Exposed Canvas in Casings

TIRE-DOH users are not a limited fraction of the motoring public—they are a large and ever growing proportion. TIRE-DOH is so valuable to the car owners that ALL of them can be made customers when shown its merits.

TIRE-DOH users are constant and consistent users. In addition to repairing tires, it can be used on every kind of rubber goods. It makes good wherever used and the customer buys again.

We help you sell TIRE-DOH by means of attractive signs and posters. Once you identify yourself as a TIRE-DOH dealer, the sales that follow will surprise and gratify you.

You will also find TIRE-DOH very useful for repair work in your shop.

Write today for our literature and trade prices.

For Sale by All Jobbers

**ATLAS AUTO
SUPPLY COMPANY**
680 W. Austin Ave.
CHICAGO, ILL.



\$5

We will **gladly**
pay any **dealer**
\$5 for an original
TIRE-DOH
window display

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

AMERICAN GARAGE & AUTO DEALER

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL

Vol. X. No. 2

CHICAGO

February, 1919



Dealer Shows Succeed; Breaking Old Records

Conclusive proof that the public has retained and even increased its interest in automotive shows is shown by the success of the exhibitions already held at Chicago, Milwaukee and New York City. All three of these functions were arranged and conducted by the dealers' associations of the respective cities. The attendance figure totals demonstrated that the interest on the part of the public was still so deep rooted that great numbers of visitors would turn out to examine the cars in spite of the fact that scarcely any new models were displayed.

There had been some idea that the shows at Chicago and New York would not be as popular as those in past years, owing to the fact that this season they were conducted by the local dealers, and thus could not be styled "national shows" as had always been the case in the past. The attendance figures for the two exhibitions prove that this view was a mistaken one.

Perhaps one of the most interesting things about the three shows that have been held is the evidence produced that the public has come to regard the passenger automobile as a business necessity, bearing out the declaration of Chester I. Campbell of Boston in his article on the local show question published in this journal in its October and November issues. While, of course, there were some cars shown that had elaborate closed bodies, which might be classed as luxuries, the principal interest was shown in vehicles designed to use for business purposes. At the Chicago show particularly there were a number of inquiries for fleets of cars to be used by traveling salesmen.

While the Chicago and New York shows did not attract as many of the high officials from factories as usual there were still a good many of these

men present at each affair. In both Chicago and New York there were almost as many dealers' conventions held as in any of the national show weeks of past years.

The four day truck show at Chicago was a successful one from the standpoint of business done although as might have been expected the attendance was not as great as for the passenger car exhibition. There was quite a turnout of factory heads and sales managers for the truck show, and these men united in reporting their pleasure over what they had accomplished. One sales manager was in a somewhat pessimistic mood when the show closed Thursday night, but Friday and Saturday he signed two of the biggest contracts that he had ever handled with new dealers.

Minneapolis Show Needs Greater Exhibition Space

The Exposition Building in Minneapolis will be the scene of this year's Northwestern Automotive and Industrial Exposition, February 15 to 22. The building that housed the show last year was passed up because it cannot furnish the space needed.

The war saw the Exposition Building turned into a barracks to house the University boys of the S. A. T. C. With the coming of peace, the government gave up the mammoth structure, where it had spent \$125,000 on improvements, and the Automotive and Industrial Exposition directors secured it for the February show.

Every model of car manufactured in America is expected to be on the floor. Farm tractors and trucks of every make will also be on hand. Manufacturers and jobbers of the twin cities have signed for space in such numbers as to make sure of an industrial exhibit second to none. There will be shown every form of labor-saving device that can possibly interest a farmer or his wife. The value of the exhibits will run into the millions.

State Dealers Flock to Milwaukee Show

The fact that the Milwaukee Automobile Show was held at the same time as the Chicago dealers' passenger car display, did not prevent the Milwaukee affair from being one of the greatest ever held in the Wisconsin metropolis. Bart J. Ruddle, who managed the show, reported that 950 state automobile dealers registered at the secretary's office. Each one of these dealers had with him all the way from 1 to 5 prospects. Seventy-five dealers from the upper peninsula of Michigan were among those who registered, but the majority of them came from the district within 150 miles of Milwaukee. The Milwaukee Journal summarizes its reasons for enthusiasm over the 1919 Milwaukee show as follows:

Estimated total of sales made, \$2,000,000.
Total attendance, 65,000.
Out-of-town visitors, 15,000.
Out-of-town dealers, 950.
Estimated increase in business for hotels, etc., \$1,000,000.
Total number of exhibitors, 141.
Increase over last year, 40 per cent.
Passenger car exhibitors, 55.
Truck exhibitors, 36.
Accessory exhibitors, 47.
Total number of vehicles, all kinds, on display, 310.

Bristol Show to Be Run by Chamber of Commerce

The Great Southern Automobile Show, C. W. Roberts, general manager, will be held at Bristol, Virginia-Tennessee, the week of April 14, announcement having just been made by the Bristol Chamber of Commerce, under whose direction the exhibition will be held. The displays will include passenger cars, trucks, tractors, trailers, accessories, tires, used cars, farm implements and airplanes.

A special exhibition building is expected to be finished by April 1, and will house the main part of the show, including passenger cars, trucks, and tractors. Another structure will be devoted to used cars. Special arrangements will provide ground space for the demonstration of tractors.

The Chamber of Commerce hopes only to net enough revenue from the show to make it pay for itself.

Omaha Tradesmen Win Strong Support for Show

Recently when the members of the Omaha Automobile Trade Association held a gathering for Nebraska dealers they asked them to bring their bankers with them to the meeting. The better understanding between the automobile men and the financiers that resulted brought much praise to the Omaha men.

The fourteenth annual show of the Omaha association will be held March 10 to 15 under the management of Clarke G. Powell, and in the Omaha Auditorium. Mr. Powell declares he expects that tractors and trucks will be displayed as well as passenger cars, and predicts it will be the largest show from any standpoint ever held in Omaha.

Omaha tradesmen have set another example for dealers' associations by obtaining the support of the Omaha Chamber of Commerce for the show. In fact, the Chamber of Commerce has become so interested that it has sent out thousands of engraved invitations a bit larger in size than the reproduction shown on this page.

"Prove It Yourself" Plan to Market Fire-Choke

A novel method of convincing dealers and consumers as to the merit of an accessory is being used by the Flexlume Sign Co., Buffalo, N. Y., in an effort to quickly introduce Fire-Choke, a dry chemical fire annihilator, which the company is marketing with considerable success. The plan which has been decided upon is a straight out-and-out, prove-it-for-yourself offer which cannot help having an appeal for everyone who has need of fire extinguishers and wants to know what they are buying before they put up their money.

The Flexlume Sign Co. is simply saying this:

"We claim great things for Fire-Choke, so much that we cannot blame you for doubting what we say. It is hard to believe that an extinguisher which will put out more fire than the others, is much more simple, and perfectly harmless, can be sold at half the price mechanical extinguishers cost.

"So we are going to do the thing up in Missourian style—we're going to 'show' you!

"If you will send us your name and address and the name of your nearest dealer we will send you absolutely without charge a test package of Fire-Choke. Of course this sample is not large enough to be of any value for protecting your home or your car from fire, but it will give you a chance to see for yourself that as a fire annihilator Fire-Choke acts like magic.

"It is an expensive way of introducing a new product, but we think it is the

cheapest in the end, for experience has taught us that all that is necessary is to get people to see Fire-Choke demonstrated in order to convince them that it is the best thing to have on their cars for fire protection."

This plan of advertising free samples of Fire-Choke is just being started, in fact the announcement on the back cover of this number of THE AMERICAN GARAGE & AUTO DEALER is only the second advertisement in which it has been

featured, but considerable publicity is planned to get the free offer before the public, and there is no doubt that the requests for free samples will be great. For this reason The Flexlume Sign Co. is more anxious than ever to obtain a general dealer distribution for Fire-Choke so that the prospective buyers who send in for test packages of Fire-Choke may be told where to buy it in their own towns. The inducements being offered dealers to stock Fire-Choke are most liberal.

THE CITY OF OMAHA

Invites you

TO THE FOURTEENTH ANNUAL OMAHA AUTOMOBILE SHOW

March 10 to 15

Commercial and civic organizations and city officials have completed comprehensive arrangements to entertain you and your families and friends.

Hotels will make you at home by having their regular commercial guests remain away during auto show week.

Theatres and movie houses will have their season's biggest attractions for your amusement.

Omaha will be yours for business, for comfort, for entertainment.

THE BUREAU OF PUBLICITY
Omaha Chamber of Commerce

Dealers Hold Annual Meeting; Re-Elect Vesper as President

With its membership total grown to within 500 of the 5,000 mark set at the start of its membership campaign a few months ago, the National Automobile Dealers Association held its annual meeting in Chicago, January 28 and 29. At the previous annual meeting the numerical strength was a few more than 600, and much praise was heard for the successful work of President F. W. A. Vesper of St. Louis and Executive Secretary E. E. Peake of Kansas City, in strengthening the organization.



F. W. A. Vesper

The sessions of the meeting were held in the Hotel La Salle's ballroom on the 19th floor. President Vesper and Harry G. Moock had their headquarters on the 18th floor where the delegates to the meeting registered and received their badges.

Plans were outlined regarding work to be done by members in their communities to help along the cause of good roads and other movements in which the association is interested. The officers feel that the various ques-

tions affecting the industry such as good roads, rural motor express, return load bureaus, and legislative affairs could be better handled through local channels than by the national organization itself.

Country Divided Into Sections

In order to parcel out the work to the best advantage it has been decided to establish a divisional form of organization. The idea is to divide the country into sections in order that the members residing in each section can attend to problems that arise in their own territories.

Both sessions of the meeting were enlivened with talks by men who have attained prominence in the industry. Tuesday George M. Graham, sales manager of the Pierce Arrow Motor Co., and chairman of the National Motor Truck Committee, talked on getting back to normal. Pres. John N. Willys of Willys-Overland Company, Inc., discussed "The Past, Present and Future of the Automobile Business."

Edward S. Jordan, president and general manager of the Jordan Motor Car Company, discussed "The Automobile Dealer's Problems in Sales and Advertising."

President Roy D. Chapin of the Hudson Motor Car Company, who recently resigned as National Chairman of the Highways Transport Committee, was to have talked on "Why the Automobile Dealer Should be a Leader in the Good Road Movement," but was unable to be present. His subject

was allotted to Pyke Johnson, formerly of Colorado, but now spreading the good roads gospel for the National Automobile Chamber of Commerce, who made a great impression, and gained many converts among the dealers through his remarks. The other speakers the second day of the meeting were F. W. Fenn and Henry Paulman, just elected President of the Illinois State Trade Association, and the Pierce distributor in Chicago, who discussed, "The Necessity of Better Business Methods for the Automotive Dealer."

F. W. Fenn, secretary of the rural motor express committee of the National Automobile Chamber of Commerce, spoke on the rural motor express and its benefits to our country.

"It has been said that when things have grown so old that they are almost forgotten they again become new and are adopted to meet our present-day needs, and transportation over the highways is one of them—it comes to us out of the misty past," Mr. Fenn stated.

"In our onward rush in the utilization of modern methods we have perfected transportation on land and sea, but the former was over steel rails. We had neglected our highways, for until recently we have not had a proper transportation machine to operate over them.

"The rejuvenation of highway transportation was made possible by the development of the motor truck to its present high state of efficiency. The medium was ready, but the highways that were to carry that medium were not, and so in a time of national peril when three-fourths of the world was carrying on a war for liberty, we found the motor truck, sometimes over bad roads, coming to the aid of our government and of our people in carrying war supplies and food that America might take her place on the battle line and help break Germany's bloody grip and throw her back.

Truck Fills the Breach.

"You know the result—how motor trucks delivered the load to tidewater when the railroads were overburdened; how they went through snow, ice and mud in freezing weather.

"A great part of our country today is without transportation of any kind except horse and wagon. We furnish transportation for all lines of human endeavor except that of agriculture, which is the most important.

"Every dealer is familiar with the rural motor express, how it serves rural America, bringing more and better food to every man's door, how it keeps the farmer on his farm that he may produce more, how it is opening up the waste places of our country and bringing them out of their isolation and into quick communication with the rest of the world.

"The rural express is here to stay—and through it the dealer is presented with a most profitable market in which to dispose of his wares—the motor truck. The farmer will eventually become your biggest patron. Cater to him.

"We need motor trucks and good roads if we are to take our place as one of the world's leaders. We must forget customs of the past and must build our roads as Rome built them. We have an advantage over Rome, when we motorize them.

Build Roads for Commerce.

"Rome built her roads for conquest—but let us build ours for commerce and defense.

"If you are interested in this rural express idea, in giving the farmer transportation and in the creation of a market for the goods you have for sale—a market which will be greater than any you now have—write me at the National Automobile Chamber of Commerce at 7 East 42d Street, New York, for full plans of organization and methods of operation, also for lists of those operators who are meeting with success, of lines that are making records, of lines down in Arkansas that are compelled to carry material on a trailer for strengthening bridges and repairing roads, which are paying.

"I will tell you of lines in interstate commerce, running into Tennessee, Alabama, and Georgia; of a rural line

which is making deliveries from one place in South Dakota to a point in Wyoming in five hours, whereas the railroad requires three days; how lines in Iowa are carrying loads cheaper than freight; how rates are lower than railway express; how motor trucks are making round trips in the time that the railway express makes one way, and of the great records that are being made in hauling live stock.

Truck Reaches Farmer.

"Rails cannot reach every farmer's gate or every community, but the truck can do so, and cheaply.

"Railways in various parts of the country are writing us, stating that the rural express is a large factor in solving the problems which they are facing, asking for our literature and expressing a desire to serve.

"A high official of the American Railway Express Company writes me that he would like to be put on our mailing list and wants to know how he can help.

"Does this mean anything to you, the transportation factors of today—reading the handwriting on the wall, can you see it? You are organized, with trade associations and a National Chamber of Commerce behind you. You have the modern methods of today and tomorrow—the most flexible transportation machine in the world. Other methods are not organized and have not your advantages.

"The rural express is not supplanting the railroad—it is serving sections that have never before been served; it is serving sections which have never been profitable to rail transportation and is relieving the rails of unprofitable short hauls.

"Your opportunity is here for serving and building."

Having been prevailed upon to withdraw his refusal to again be a candidate Mr. Vesper was unanimously elected President succeeding himself. The other officers elected were, vice-president, E. W. Steinhart, Indianapolis; vice-president, Harry D. Austin, Seattle; treasurer, Thos. J. Hay, Chicago; Board of Directors: A. E. Mitzel, Canton, O.; G. A. Graham, Minneapolis; P. E. Chamberlain, Denver; Geo. D. McCutchen, Atlanta; W. G. Brace, Kansas City; H. L. Robertson, Houston; P. E. Greer, San Francisco;

G. B. Kimball, Boston, and A. E. Maltby, Philadelphia.

In recognition of the very effective service he has rendered to the organization during the past few months, the title of general manager was formally bestowed upon Harry G. Moock.

Jobbers Freed of Charges of Restraining Trade

Commissioner Wm. M. Webster has announced that the United States District Court at New York City has freed the members of the former National Association of Automobile Accessory Jobbers from the charges of monopoly and restraint of trade. The suit against the jobbers, under the provisions of the Sherman law, began in New York City January 18.

It has always been the contention of officers and members of the jobbers' organization—which changed its corporate title to the Automotive Equipment Association at a recent meeting in Chicago—that they had no intention of trying to monopolize or restrain trade, but were trying to stabilize prices. In the summer of 1917 an indictment was issued against 21 members of the association. The witnesses against the jobbers were mostly employees or members of firms that have conflicted with the trade principles of members of the organization.

The jury returned a favorable verdict for the jobbers in less than half an hour after listening to the charge of Judge Hand, who presided at the trial.

Colorado Man Chosen for National Good Roads Post

Pike Johnson, editor of the Colorado Highways Bulletin and a member of the Colorado Highways Transport Committee, has been made secretary of the Good Roads Committee of the National Automobile Chamber of Commerce. He will be located at the Washington bureau of the chamber, working in co-operation with Roy D. Chapin, chairman of the committee.

Mr. Johnson comes from Denver, where he had been engaged in newspaper work for a number of years prior to his work on the Bulletin. He was chairman of the committee which made "Highways Transport Day" such a great success recently in Colorado.

To overurge a customer is to make him fight shy of you at all future times. By your manner and words show that you value what you are offering him very highly, and that you do not have to overurge customers because there are plenty who see the advantages and are ready to do business.

Truck Prices Not to Be Lower After War, but May Increase

BY. J. C. AYERS,
Vice-President,
Denby Motor Truck Co.

There is naturally, at this one time, a great deal of uncertainty in the public mind as to the possibility of a revision of prices on all kinds of merchandise.

In many lines, there will undoubtedly be a reduction. On the other hand, there is a large number of products on which no cut is possible. Not only must each class of merchandise be considered separately, but, in many cases, each article and each make must be analyzed, if an accurate forecast is to be made.

In order to foresee the effect of the return to peace-time conditions on the selling price of any commodity, it is necessary to consider the things that have determined the price during the war. For prices now, more than ever before, are to be based on value.

Many products have been arbitrarily advanced in price because of the restrictions of production and the inability of the makers to fill the demand. Smaller production increased overhead and forced higher prices. Manufacturers affected by this condition will lower costs and should lower prices proportionately. Some makers advanced prices even beyond what increased costs justified. These firms will have to readjust their figures radically if they are to get on a par with competitors who have been fairer with their customers.

The great majority of passenger car makers fall in the class of manufacturers who will be able to reduce costs within the near future, not because materials will drop in price, but because quantity production will cut building and selling expense.

Truck Production Not Cut.

The position in which the makers of established trucks find themselves is, however, very different from that of the passenger car makers. Production, with the better truck com-

panies, was not cut but diverted from commercial to military use. While the trucks available to the dealers were much fewer in 1918 than in 1917, the number built was greater, which means overhead has been as low, or lower, in 1918 than in 1917.

Prices have risen somewhat, but only what was necessary by higher material and labor costs. Manufacturing efficiency is greater now than in past years. Any reduced costs in trucks would necessarily come from cheaper materials or labor.



J. C. Ayers.

Materials used in building motor trucks are practically all in the class the demand for which the cessation of hostilities increased. Steel, copper, rubber and wood have been denied to hundreds of lines, all of which will now bid for their share. Higher prices are bound to result as the outlets are increased.

The recognition that wages must be maintained at their present plane is general. The government has taken every precaution to see that the labor market is kept in balance, for it realizes that continued prosperity can come only if the worker share fully in the benefits of our world-wide business.

The men released from munitions work and from the military forces are needed in other lines, now expanding with the removal of restrictions. There are thousands of companies whose small commercial output during the war has resulted in practically exhausting all supplies, not only the stock with dealers, but also with jobbers and branches. It will take months, and in some cases years of forced production for them to catch up with even the domestic demand. All this means not only materials, but also workmen.

We can see no prospect of a general reduction in trucks. A few makers may be forced to cut because their trucks cannot show a value commensurate with their price. But with good trucks, of established standing, no cut is possible.

There is, however, a decided possibility of higher truck prices. This depends on quantity production. The factories are on an efficient basis; materials and labor are fixed within close limits; and the maintenance of present prices depends on keeping up production. Delays and procrastination in buying can only bring higher prices.

TANK FOR MADISON SHOW.

One of the features of the annual automotive show to be held from February 26 to March 1 in the Union Storage building at Madison, Wisconsin, will be a tank similar to those used in the war. In addition to passenger cars, tractors, trucks, motorcycles and accessories will be displayed at the exhibition which will be held under the auspices of the Automobile Dealers' Division of the Madison Association of Commerce.

Business is a good deal like a game of chess, or driving an automobile on a State Road—you've got to take into constant consideration what the other man is likely to do.

"Sell the Functions" Is Keynote of Four Days Sales Convention

"Sell the Functions," was the keynote of the sales convention of the National Cash Register Company at Dayton, January 27 to 30, inclusive. The idea brought out by the principal speakers, both members of the cash register forces and several of the visitors, was that merchants generally would be more likely to purchase cash registers if they understood thoroughly what the machine would do for them.

Thus it was that the slogan "Sell the Functions" was adopted by general agreement. For a time it was quoted as "Sell the Functions of the Machine and not the Machine" but in the rapid-fire exchange of ideas and discussions over various points the trimmings were shorn from the expression and it was cut down to the three vital words.

The idea back of the slogan is one that can, and should, be taken up with great enthusiasm by every automotive tradesman whether he owns a big store or whether he works for another man. Good truck and tractor salesmen especially, have been selling the functions of their machines right along without perhaps realizing this. For if they had not been doing this very thing, they would not have become good salesmen.

Meeting Extended Itself.

President John H. Patterson lived up to his reputation of being the greatest trainer of salesmen in the world. He spoke at most of the morning and afternoon sessions of the convention. It had been planned originally to have the affair end in three days but there were so many new and interesting phases of business brought up that the meeting was extended for a day.

Next to the keynote expression, the most striking saying during the meeting was the declaration by Col. Philippe Bunua-Varilla, a representative of the French Government, that "Pub-

licity is Morality." The remarks that accompanied this assertion were as follows:

"What inspires me most is the harmony of this organization and the methods by which it is run. Cleanliness in everything seems to be the motto of this factory. The fine thing about this industry is that it is putting business on a high moral plane. The cash register not only saves work, but it is an ingenious mechanism. It is a thing of publicity and from the good which it does we can say that publicity is morality."

New Sales Idea.

To some of the visitors one of the selling ideas emphasized was both new and at the same time hard for them to understand at first. This was the in season and out insistence by company officials, high and low, that every salesman should tell every prospective purchaser about the cash register the same way and be certain to bring out certain points of the functions of the machine every time he talked to any one concerning it.

But the cash register folks were prepared to answer all questions on this point by the simple statement that this one particular practice has produced profits for salesmen every year since the plan was adopted by Mr. Patterson. Incidentally this is an idea that would certainly help salesmen for passenger cars and trucks to annex more orders.

One pleasing feature about the convention was the constant presence of men and girls from the factory workshops and the general offices of the firm. They filled the great school house auditorium at noon and even in the middle of the morning or the afternoon there were few vacant seats. One of the trade paper visitors remarked that he had never seen so many happy and contented men and women in an industrial plant, and he

had visited a good many of the great manufacturing plants in this country.

President Wilson Favors Road Construction Work

President Wilson favors the earliest possible resumption and extension of highway construction under the Federal Aid Road Act and has written Secretary of Agriculture Houston to that effect. The Secretary of War also has written the Secretary of Agriculture in favor of highway work.

The President's letter follows:

"Dear Mr. Secretary:

"I heartily agree with you that it would be in the public interest to resume in full measure the highway construction operations under the Federal Aid Road Act, and to do so as speedily as possible. I understand the necessity which existed for their contraction during the stress through which we have been passing, but that obstacle is now removed. I believe that it would be highly desirable to have an additional appropriation made available to the Department of Agriculture, to be used in conjunction, if possible, with any surplus State and community funds, in order that these operations may be extended.

"It is important not only to develop good highways throughout the country as quickly as possible, but it is also at this time especially advisable to resume and extend all such essential public works, with a view to furnishing employment for laborers who may be seeking new tasks during the period of readjustment. Knowing that the Department of Agriculture and the State highway authorities in each State have been carefully working out road systems and developing plans and specifications, I have no doubt that all activities in this field can be vigorously conducted through these two sets of existing agencies, acting in full accord.

"Faithfully yours,

"WOODROW WILSON."

The man who knows it all and who cannot benefit by the successes and failures of those in the same line as himself and even in other lines, is to be pitied. We are all furnished with baskets of different sizes—mental capacities—and some have such small baskets that they get them full mighty soon!

NEXT!

With the certain increase in the demand for passenger cars, trucks, trailers, tractors, and accessories that is bound to show itself in the next few months, the tradesman who has put his business establishment through a general polishing up is sure to get more than his share of the profits. We know from reports and letters received at this office that many of our readers have either finished this task of brightening the corners, or are preparing to do so.

Particularly in the selling of passenger cars, tires and accessories the value of neatness in a store cannot be overestimated. As women either are the purchasers themselves or influence the buying in a very great percentage of sales of these classes of merchandise there cannot be any argument as to the cash value of a bright, clean showroom. So that it will be a good plan for every automotive tradesman who has not already done so to look his place of business over, call out "next!" to his store and then proceed to have the loose edges trimmed off and the rough spots smoothed out until the place looks as spick-and-span as a man just out of a barber's chair.

The suggestion has been made that it might be a very good plan for the various dealers' associations throughout the country to establish a "clean up" week. While it may be thought that this would benefit only concerns who hold memberships in these organizations there is little doubt but that the example of these organized tradesmen would result in a great many dealers not members of any trade association taking up the idea.

Appeal to Women.

Because women are more likely to be interested in a good many of the accessories that make cars operate easier or ride more comfortably the plan of "dressing up" a showroom where cars or accessories or both are displayed is certain to bring in quick cash dividends. Even when the women members of a car-owning fam-

ily do not drive themselves they would certainly help increase the sales of seat covers, or foot warmers, or shock absorbers or any of the various other accessories that have a direct appeal to the person who is only a passenger in a motor vehicle.

There need be no big expense required in carrying out this idea, except perhaps a little money spent for paint. The main thing to do is to see that the floors are kept swept clean, and the windows and showcases washed and polished as often as may be necessary to keep them in proper condition. One advantage that will follow the adoption of this clean-up idea is that it will undoubtedly result in a dealer or his employes changing the displays of goods in the windows and showcases more frequently than they had been in the habit of doing. This also will help bring in more profit from increased sales.

This plan of cleaning things up need not be confined to showrooms, for garages, repair shops, and service stations very frequently are in greater need of such treatment than showrooms. In fact, M. E. Faber of the C. A. Shaler Company has declared that what many garages, repair shops and service stations need are "lady housekeepers."

Cleaning Up is Profitable.

Mr. Faber advances this idea only after having visited hundreds of garages, repair shops, and service stations in big cities and little towns all over the country during the past few years. He knows of quite a few owners of garages, service stations or repair shops who have done this cleaning up work—not always directed by a lady housekeeper, to be sure—who found that the carrying out of the plan saved time and made money for them.

And like a good doctor, Mr. Faber has taken his own medicine, in a business sense. To be sure he did not have a garage or repair shop or service station in which to install his lady housekeeper, but the same principles

and practices which guided Mr. Faber in what he did are certain to bring good results in any establishment where the idea is tried out.

The place that Mr. Faber selected to try out his plan was the printing department of the Shaler plant in Wau-pun. He said that the printing shop was typical of most similar places in its disorder and dirt, and that it looked very much like the average printing shop or for that matter like too many garages. The printers' idea of order was to have a housecleaning once a month, if they got around to it, and let nature take its course the rest of time.

The result can be easily imagined. Type was left standing on galleys when it should have been sorted into the cases, small cuttings of good paper laid around until they were ruined for use, and twice the time was spent hunting for things that it would have taken to put them where they belonged in the first place.

A girl was needed to help out on some little jobs of folding and stitching. Mr. Faber had an idea that something could be found for her to do all of the time in the printing shop, so she was released from another department for as long as she would be needed in the printing plant.

The boss printer was away, a victim of the flu. Mr. Faber was delegated to instruct the girl regarding her duties in the printing department. So first he made her a little speech about as follows:

Girl Elected Housekeeper.

"Now you are elected housekeeper for these old bachelors. They like a clean place to work in as much as anybody does, but they don't know how to keep it that way. Here is your chance to show them, and incidentally to have a clean and more pleasant job than any other girl in the shop. Do what you want to, and get the men to do the heavy work. Scold them properly, just as if you were at home, when they leave things out of place, and let dirt accumulate."

Mr. Faber says, even if the plan was his, that it was worked out surprisingly well. He declares that while they have no lace curtains on the windows as yet that he will bet that they have the cleanest printing plant that any one ever saw. And what counts most is the fact that they are turning out more work with less effort than they ever did before.

If this lady housekeeper plan pays in a place that the public never sees, Mr. Faber says it certainly would pay much bigger in a place where appearance is a selling asset. It is Mr. Faber's belief that the average man appreciates neatness as much as a woman, but he does not always know how to go at it to accomplish results. He may not even be sure that it is dirt and carelessness that prejudices him against a place, but there is pleasure and satisfaction in doing business in a clean place that has a mighty effect.

From his observations Mr. Faber finds that women are beginning to have more to do with cars than they used to. So when a man's wife begins to say "I don't see why you want to keep your car in that dirty garage, or visit that cluttered up showroom, or go to that mussy service station" the man begins to take notice of the condition that prompted the remark.

Moral: *Having cleaned up your own place try to induce your neighbors in the same line of business as your own to follow your good example.*

\$5 for an Attractive Window Display

If you will send us a picture of your window display, together with a description and a report of the results, we will gladly award \$5 to you for photographs accepted for publication.

One Price and Good Service Win for Colorado Dealers

Paul F. and C. J. Vollmer, the men who constitute Vollmer Bros., started a Ford agency in April, 1913, on a very small scale, as there had only been sold 39 Ford cars in their territory the preceding twelve months, and in the following nine months they sold 103, and for the year 1916, 436, or a total from April 1, 1913, to December 31, 1916, of 1,111 cars.

In spite of the fact that the demand for cars fell off so greatly during 1917, especially after this country entered the war, Vollmer Bros. delivered 415 new Ford cars, all they were able to obtain. It would have been a simple matter for the concern to have sold more cars last year than they were able to get in 1917, but it was only possible to obtain 210 new Ford cars on account of the Ford Motor Company stopping regular production in order to take care of government contracts. The outlook for the year 1919 is very bright in all lines.

One of the first rules ever laid down by the firm was that one price only would prevail, and this rule has never been broken, even on the smallest item.

If you handle a line of tires, they believe that the right price for that tire is the one issued by the tire company, and they never allow a discount.

Early in their career they lost a car sale over an item of extra equipment, costing them \$1.40. This, to their knowledge, is the only sale they ever lost owing to maintaining one price, although they stood ready to lose a certain percentage of business to maintain the one price system.

They believe that more garages and sales agencies owe their failure to price cutting than any other one thing, and they have proven, to their satisfaction at least, that the necessity for it lies mostly in a man's own mind.

Their building is 100x190 feet on one of the best corners in Colorado Springs, and



The Vollmer Building.

Vollmer Bros. have also become distributors for the Fordson tractor for the entire southern half of Colorado. They already have contracts to deliver more than 1,000 tractors this year. Their traveling representative is kept on the road all the time to attend to the service needs of the Vollmer tractor customers. Vollmer Bros. also impress upon all of their dealers that all tractor buyers should receive the same careful attention from a service standpoint as that given from the Vollmer store in Colorado Springs.

The Vollmers found that much valuable time was lost when it was necessary to have paint jobs attended to outside of their own shop, and have established a paint and body department which employs 6 first class men. It contains all necessary machinery for the manufacture of bodies and there are facilities to paint anything in the automobile line.

This department builds bodies of every description, both for the Vollmers and their various agents and sub-dealers. The Vollmers have also gone into the business of furnishing solid tires, and have installed a 200 ton hydraulic press to give prompt service to buyers of solid tires for commercial motor vehicles.

is brick and concrete, with stucco finish; sprinkler system throughout, which, with the construction, has cut their insurance down to a minimum.

One of the great mistakes made in garage building is cheapness of construction. There is hardly a business that is harder on a building than the automobile business, yet most concerns put up buildings of such poor construction that they are ready to tumble down in a few years, besides costing almost enough in additional insurance to have paid for a well constructed building.

One of the big factors in the success of Vollmer Bros. has been service. They never keep a man's car over a few hours, no matter how large a repair job he has done. They have overhauled a car, including reboring cylinders, in a little more than four hours, and to one price and bang-up service they attribute the credit for their business prosperity.

On a trip to Lille, France, recently, Commercial Attache Pierce C. Williams found that the city was being provisioned with food sent all the way from Paris in motor trucks.

EDITORIAL REMARKS

Shows Surpass All Records

Business results from the shows that were held up to the middle of February have more than justified the expectations of their most ardent advocates. There have been some persons in the automotive industry who voiced the fear that the shows would not be as popular as formerly because scarcely any of the car makers had anything new to show, and some of the timid ones feared the attendance would be hurt by the lack of novelties. That this was a mistaken idea was proven at Chicago, Milwaukee and New York, all three of the affairs in these cities having been conducted by the local dealers' associations.

So far as the number of visitors were concerned new records were made, and many of the exhibitors in the affairs in the three cities named sold more cars than they had ever done before during the show period. The business prosperity enjoyed by the exhibitors in the shows was not confined to any one line, but sellers of cars, trucks and accessories all reported that they had done far better than they had expected.

Looking Forward

Looking forward to the New Year, which has recently emerged from its shell, we who live in the good old U. S. A. have the comforting thought that as a nation we are infinitely better off than we were a year ago.

Not alone in the inventory of worldly goods, but in the knowledge that we have successfully passed through what many believe to be the greatest crisis the country has ever known, may we congratulate each other and face the future with confidence and courage. The war is won, and, while many perplexing problems are waiting for solution, that fact alone enables us to meet whatever lies ahead with a brave and hopeful heart.

The Comptroller of the Currency reports that in two months (August 31 to November 1) the resources of the national banks increased \$1,777,799,000, bringing their total to the tidy sum of \$19,821,404,000, which sets a new high record. That is just one high light on the situation to show how well fixed financially our country is. But we get a clearer conception of what these figures actually mean when we are told that the resources of our national banks exceed the combined resources of all the national banks in England, Canada, France, Italy, the Netherlands, Norway, Sweden, Denmark, Japan and Germany!

The state banks and trust companies, being more numerous, are even richer than the national banks, as the comptroller says the former institutions had a billion more resources than the latter as far back as June, 1917, when their reports were last tabulated. The banks have grown as much in the last five years as they did in the twenty-five preceding.

So it will be seen that it is not the commodity known as money that we need to worry about. We have the wealth, the credit, the national resources and the human forces to utilize them. Our problem is how to use these tools in building a structure that will endure in the years to come.

Right here the attitude of our government and its relations toward business have an important bearing on the situation. Naturally, the strong arm of the national administration has grown much more muscular during the war, for exercise of power develops more power, just as exercise of the muscles tends to greater bodily strength.

Men in governmental authority during the war now desire to extend their control over private affairs into peace times. This perhaps is not surprising, for it has been said that the history of most wars shows it is easier to demobilize an army than to demobilize the office-holders. The quick, patriotic response of the American people to the demands of the government to submit to unusual conditions to win the war has encouraged these officials to try to perpetuate these conditions.

What do the people think of it? A writer in Collier's says: "The sobriety, intelligence and discipline of the people in the stress of war should be a warning to political leaders that these same sober, intelligent and disciplined people will not permit war conditions to continue after the war is over."

Push Highway Improvement

Members of the retail automotive industry, whether they own or are employed selling passenger cars, trucks, tractors or accessories, or in repair shops, or service stations, should do everything possible to further the improvement of the highways in their neighborhoods. When they are members of trade associations they should see to it that their organizations help to arouse the interest of their neighbors to the need of good roads. Many cities and towns have been immensely benefited after highways had been improved through the increased business thus made possible for their merchants and manufacturers. Improved roads benefit both dwellers on farms and in cities. The farmer is better off because he can move his produce to market more rapidly and cheaper and take back the machinery and other needs easier than before, while the city man gets the benefit of fresher vegetables that he can buy cheaper because the grower has been under a lessened expense for transportation.

Cash Chases Cleanliness

If all the readers of this journal will keep their garages, showrooms, service stations and repair shops

so neat and clean and orderly every day of the year that no spring housecleaning is ever necessary, they will find the title of this editorial, "Cash Chases Cleanliness," to be true. At one time or another a few merchants in some lines of business have said that the reason some stores were clean was because those stores were making money and the owners could afford to keep the places clean. But this is putting the cart before the horse. For when a place is kept clean it is much more likely to make money than if permitted to become mussed up

and dirty. This whole idea of the profit value of neatness is brought out at greater length in an article on page 16, and also by the cartoon labeled "Next!" on page 9.

One of the most valuable features of cleanliness in a showroom is that it has a tendency to keep up the interest of salesmen in their work. Successful salesmen are sure to stay longer with the employer who sees to it that his showroom is kept in an inviting condition all of the time.

Only Two Weeks Left to Enter for Sales Idea Contest Prizes

Hurry along your entries for our Sales Idea Contest, as the competition will close March 1 and the names of the three successful individuals or concerns will be announced in the April number of the AMERICAN GARAGE AND AUTO DEALER.

All sales plans submitted as candidates for one of the three prizes—first, \$25.00; second, \$15.00, and third, \$10.00—will be considered by the contest judges if the postmark on the envelope is not later than March 1. Plans that are mailed later than March 1, will not be eligible for the contest but, provided they are acceptable for printing, will be paid for at our regular space rates.

Our readers are interested in sales plans of any and every sort that have brought increased business and greater profits to automotive tradesmen. No reader should neglect to tell us about some successful sales idea he knows about because he thinks it is an old story. To be sure, the details of it may be ancient history to one man or in one city or town but the plan may prove such new and welcome news to others that it may capture one of the three awards offered by the publishers of this journal.

There are no limitations—except that the plan must have produced profits. The successful sales plans or merchandising ideas we want to hear about in order to tell our readers about them may have been devised by dealers in big or small cities or by some enterprising merchant whose place of business is located in a tiny country town. The size of the community in which the idea was used will not be

taken into consideration in making the awards. The sole question will be:

DID IT PAY?

The sales ideas that we wish to hear about may be one of several different methods of merchandising goods or

ners may have been selling passenger cars, trucks, trailers, truck-makers, tractors, farm electric plants, tires, accessories, garage and repair service; any one or all of these lines. But the plan **MUST HAVE MADE MONEY!**

Motor Truck Board Is Organized by the A. A. A.

Realizing that the passenger automobile and motor truck are economical fellow-occupants of the road, the American Automobile Association, through recent action of its executive directors, has added to its list of national boards one which will have to do with motor truck operation. President David Jameson has appointed as the chairman of the new board Stedman Bent, president of the Automobile Club of Philadelphia, who is thoroughly acquainted with motor truck transportation needs.

John R. Eustis, who has made a special study of road transportation, is the new secretary of the Motor Truck Board. Offices will be opened at the New York City A. A. A. headquarters, 501 Fifth avenue, at Forty-second street, claimed to be one of the busiest corners in the United States.

The Motor Truck Board will include men from all sections of the country, and every A. A. A. club which creates a motor truck committee will have representation on it. In order that all interests shall have a voice in the conduct of the board, George M. Graham of Buffalo, chairman of the motor truck committee of the National Automobile Chamber of Commerce, has been asked by Chairman Bent to serve on this new board of the national automobile organization. C. A. Musselman of Philadelphia, George H. Pride of New York City, E. C. Dunbar of Detroit, Henry Paulman of Chicago, W. B. Cheek of Omaha, Joseph Decker of Salt Lake City, and H. R. Basford of San Francisco are among those who will be called upon to act on the board. Other members will be announced later.

\$50 for sales ideas

\$25 - First prize
\$15 - Second prize
\$10 - Third prize

Try for one of them!

services at a profit, or a combination of one or more plans. It makes no difference whether the profit-producing idea was carried out through the medium of newspaper advertising, or billboards, or painted signs, or direct-by-mail circular campaigns, or by going after customers in person, or by telephone or by combining two or all of the methods named. Any plan not included in those mentioned above is eligible for contest—provided only that it produced profits for the man or concern that carried it out.

All members of the retail automotive industry are eligible to try for one of the contest prizes. The win-



Name JOHN R. CAROWNER
Address 418 Grand Avenue
Telephone Main 3396
Car Hupmobile
Rims Detachable, straight side
Front 33 x 4
Rear 33 x 4-1/2
Spares Has locked carrier for two tires on rims and two extra rims but no spare casings or tubes at present (2-18-19).

One of the most profitable winter occupations for the tradesman who sells tires is to make a census of the tire sizes used by motorists in his neighborhood. And in this case "neighborhood" is used to describe the territory, whether 1 square mile or 500 square miles, in which a tire dealer intends to market his goods.

The simplest way to keep track of these tire sizes would be on a 3 x 5 inch card, and a sample card form that could be used is shown above. In a good many instances the tire merchant will be able to fill out these cards himself from his own knowledge of the tires used by his own customers and other motorists who are his neighbors.

In other cases the information about tire sizes can be obtained by telephoning to car owners. When asking them for the figures it will be an excellent plan to inquire if the person to whom the dealer is talking does not need some tires or tubes or other accessories. In the case of a car owner who cannot be reached by telephone, the same form that is printed on the cards could be printed at the bottom of a letter sheet, and sent to the owners with a letter, above the card form, reading as follows:

Please fill out the information concerning your car, its rims and tire sizes on the blank below, and return it to us either in person when you are passing our store or by mail.

We are gathering the figures concerning the sizes of tires used by car owners in this territory in order that it will be possible to lay in a stock of the sizes most used around here so that when the time comes that you need a new tire we will be able to furnish it at once, and without sending to a branch warehouse of some big tire maker to get it.

Yours very truly,

Enterprise Automotive Company.

When the tire size census is as complete as it seems possible to make it, the cards should be sorted out so that all of the cards of owners who, for instance, use 32 x 4 tires front and rear would be kept together. After the dealer has made up a summary of the census so that he knows how many cars there are that use a certain size tire he will be in a position to estimate about how many casings and tubes of each size would be used in his sales territory during a year. This information will be of great help to him, as it will furnish the figures upon which to base his orders for tires, because he

will know pretty well about how many of each size he will be able to market.

But the most valuable feature of the tire census is the use that can be made of it in planning sales campaigns. This knowledge would also simplify the writing of circular letters, as a stenographer would know that all the letters addressed to the cards of one lot were to give figures on the same size of casings and tubes.

With these figures instantly available it should be possible to make more sales by telephone than if it were necessary for the car owner to give the size of the tires and the style of the rim. All the car owner will need to do will be to telephone in or have some one else telephone for him, and, say that he wants one rear tire ready to put on his car when he drives to the dealer's store in 15 minutes.

F. C. H. Troesch to Export American Tire Products

F. C. H. Troesch, formerly in the export department of the Firestone Tire & Rubber Company, has accepted a position with the American Rubber & Tire Company, of Akron, as export manager.



F. C. H. Troesch.

her Company, has accepted a position with the American Rubber & Tire Company, of Akron, as export manager.

Install a Curtis Air Compressor



The Curtis Sign

Illustrated above—is 10x14 inches—baked enamel on steel. Cannot be bought, but is furnished FREE with every CURTIS Garage Air Compressor—and cannot be had in any other way.

Display a CURTIS "FREE AIR" SIGN above your door—it inspires confidence and will help build your business. Motorists are looking for this familiar CURTIS slogan—because they know oil rots tires—and that a CURTIS Air Compressor furnishes AIR FREE FROM OIL, which means fewer blowouts, greater tire mileage and less repairs. The CURTIS is the ONLY Garage Air Compressor with the controlled splash oiling system that eliminates all danger of forcing oil into the air line.

CURTIS AIR FREE FROM OIL

Investigate the many exclusive features of CURTIS Garage Air Compressors. The line is complete—five sizes—stationary or portable. Just write your name and address on the margin of this advertisement—tear it out and send it to your jobber, or to us direct, for complete information and prices.

Curtis Pneumatic Machinery Co.

1515 Kienlen Ave., St. Louis, Mo.

Branch Office—530-U Hudson Terminal, New York City



Radiator
Leaks

Battery
Terminals

Gasoline
Tank

Pipe
Joints

Electric
Light
Connections

General
Garage
Work

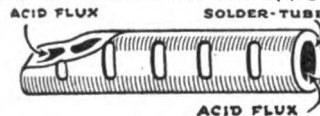
Speedometer
Flexible
Shaft

Spark Plug
Terminals

Carburetor
Connections

KESTER ACID-CORE WIRE SOLDER can do any of these jobs.

The self-fluxing feature of this solder makes it especially adaptable to automobile work. When working in a poor light or on those almost inaccessible parts of a car, it is very difficult to handle and apply a separate soldering acid



With Kester Acid-Core Wire Solder you eliminate the hardest part of the work because it is ready-to-use; the core of the solder tube is the soldering acid. A trial will make you a permanent user. Will solder any metal except aluminum.

Sold on 1, 5, and 10 lb. spools and in 1 lb. coils in cartons. Popular size $\frac{3}{8}$ " diameter.

Order from your jobber or direct.



Chicago Solder Co.
CHICAGO - U.S.A.



P. S. Also manufacturers of Kester Rosin-Core Wire Solder.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

In the Truck and Trailer Field

There is no closed season for the sale of trucks and trailers, as both of these classes of vehicles must be used every business day of the year. It may be that it is not possible to sell passenger cars, or at least those of the usual open type variety, during months when the roads are covered with snow or the air is so cold that driving is attended with some discomfort. But no such period exists in the use of commercial vehicles such as trucks and trailers.

In regions where there is a good deal of cold weather a dealer who is handling trailers can make the cold weather one of his arguments to sell trailers. In the case of merchants or manufacturers whose goods to be

transported are of the kind that take a long time to load, a trailer has the advantage of not having a cooling system that might freeze up while the vehicle is stationary. If this point is properly brought out trailers can very often be sold to concerns that have one or more trucks which are not quite up to doing all of the hauling work their owners would like. The use of a trailer in connection with a motor truck increases the hauling capacity of a transportation outfit to a much greater degree than would seem possible when the small additional outlay of money is considered.

Another advantage of using trailers is that they can be backed up to loading platforms and left standing for

hours in the worst of winter blizzards that might result in death to horses or serious damage to a motor truck with its cooling system filled with water that may freeze because of the very low temperature.

In many cities and towns there are merchants or manufacturers whose businesses are such that they could only use a truck for part of the time, and who for this reason have not felt able to buy one. More than one shrewd motor truck salesman who has studied this condition has brought orders in to his employer by matching up some of these concerns who could only use a truck for a portion of each business day.

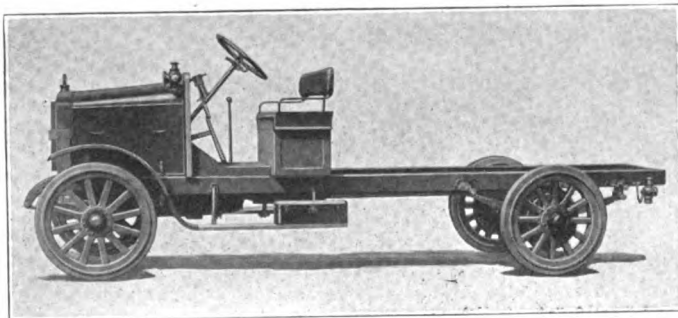
Acason Firm Announces New One-Ton Motor Truck

A one ton capacity truck is announced by the Acason Motor Truck Company of Detroit as an addition to its line of heavy duty vehicles. This new truck will take its place with the 1½, 2, 3½ and 5 ton trucks produced by this company for some time. It will carry thoroughly tried units and have all of the high grade features of the other Acason trucks.

In announcing the one ton truck H. W. Acason declares this addition to the Acason

plant, four cylinders, 3-point suspension, 3½ inch bore and 5½ inch stroke. The magneto will be Eiseman; the carburetor optional Schebler or Rayfield. The rear axle will be Timken-Detroit David Brown worm axle with Timken bearings throughout. The motor will carry a 3 bearing crankshaft of 2 inch diameter. The frame will be of unusual rigid construction 202½ inches over all.

A national highway to link up the national parks and monuments of the United States is recommended in the annual re-



Acason One-ton Truck

line would have been made some time ago, but war conditions intervened. He maintains that the performance of one ton trucks in the war proved their value beyond dispute and that they will be a big factor in the commercial readjustment period.

Acason distributors have known for some time that a one ton Acason truck would be announced. The one ton Acason will have 144 inches of wheelbase, a loading space of 118 inches back of the seat. It will be equipped with a Buda power

port of the director of the national park service. Attention is called to the fact that such a road would necessarily pass thru undeveloped districts and as the states or counties could hardly have funds enough for the work, Federal construction is suggested.

There are 4,000 automobiles in Japan according to Y. Bryan Yamashita, banker of that country now here. The small number of machines is attributed to the fact that the country has no good roads.

New York Girl Succeeds Selling Motor Trucks

Miss Anna Baumwald is one of the few successful truck saleswomen in the country. An interesting story could be written about the way she has worked up from little factory girl to successfully selling commercial motor vehicles.

Attending night school was the first step in her advance; a position as bookkeeper was the second. Not satisfied with this, she took a course in accountancy at the City College of New York. And, as she tells the story, "One day, while attending a lecture at the college, she became thoroughly disgusted with the idea of being an office machine."

She decided to cut loose from office work. And she did the job in a very thorough manner. She decided to break into a field that was generally supposed to belong to the opposite sex—the motor truck business.

"It was a decided novelty at first," says Miss Baumwald. "Men smiled when I came to present my proposition and some of them expressed the opinion that I was the nerviest woman in the world. But in a short time they became accustomed to the idea and now I have very little difficulty, particularly as I have an organization that backs up any promises that I may make for them."

Miss Baumwald has made a success that most any truck salesman could be proud of, as is attested by the fact that her average sales have been about six trucks a month for the last six months. She is employed by the Arlington Motors Co., New York distributor of Clydesdale trucks.



There's the Polish that's right

"Let me tell you of an experience I had with Waxit. I had invited some friends for a Sunday afternoon's drive. In the morning I was called out into the country. I reached home just a half hour before I was due to take my friends out and the car was a sight. I rushed over to the nearest store for some polish. I chose Waxit because its appearance appealed to me and got busy with a cheese cloth and Waxit.

"The way the dust and grease came off was wonderful. And as the soil disappeared a brilliant polish took its place. In twenty minutes I had gone over the whole car and she shone like a mirror. I drove around for my friends right on the dot, and they complimented me on the appearance of the car."

Waxit

"The
Perfect
Polish"

Try it—you'll be convinced

It cleans and polishes in the same operation. No hard rubbing, for it leaves a dry finish—not a film of oil or a smeary surface. It is beneficial to the finish—keeps car looking new—and makes boosters of its users.

We co-operate with the dealer in every way. Attractive window trims, electric signs and counter displays are supplied.

Write us for full sized package and our dealer proposition

WAXIT MANUFACTURING COMPANY

1539 Old Colony Building, Chicago, Ill.

Waxit Manufacturing Co., 1539 Old Colony Bldg., Chicago
Kindly send me full sized bottle of Waxit and your dealers proposition.
Name
Address
City
State

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

MANUFACTURER - DEALER *Helps*

Bergie National Spark Plug Co.

The cut-out illustrated, in reduced size, is very effective for use in making window displays, or for counter

and show case display. It is attractively printed in five colors, 10½ inches by 14 inches in size, with easel back, and the slogan "Every Spark, — a Bark" catches the attention of motor users, and brings them into the store for more information about National spark plugs.

This new dealer's help is now being sent to every National dealer by the

Bergie National Spark Plug Co., Rockford, Ill., and those dealers who have already used it for making window and counter displays have found it a "Silent Salesman" that never fails to attract attention, excite interest and increase sales. National dealers should not fail to write at once for one of these attractive cut-outs to help increase sales. It is a dealer's help that brings most satisfactory results.

FRANK M. COMRIE, Advertising Counsel.

Waxit Mfg. Co.

The Waxit Mfg. Co. is starting a vigorous advertising campaign to further stimulate the demand on Waxit.

Waxit, as the advertisements state, is both cleaner and polish. Its function is first to take off the dirt, grease and dust, and restore the brilliancy of finish which it formerly possessed. Both of these results are accomplished in the same operation. No oily film or waxed surface is produced. The original lustre is brought back.

The various advertisements in the present campaign depict scenes that are

familiar to very car owner. For instance, a man is shown looking at his car with an air of despair for he has in-

vited friends to take a ride, and the car is looking the worse for travel. However, the little Waxit girl arrives at the psychological moment with a bottle of Waxit and saves the day. In addition to its journal advertising, the Waxit Company provides its dealers with attractive cut-outs and counter displays.

The display pictured is provided free of charge, with the first order of merchandise, and it has been amply demonstrated that it helps materially to move the goods. Waxit is sold in 6 oz., 14 oz. and quart bottles, and half gallon and gallon cans. Dealers are invited to write Waxit Mfg. Co., Old Colony Bldg., Chicago, mentioning this paper, for the attractive dealers' proposition.

W. B. SWANN, Advertising Counsel.

Buffalo Specialties Co.

We furnish the illustrated counter and window cutout of our new Radiator Neverleak. The cutout is life size and stands about 3 feet high. It is reproduced in all the

original colors and is so constructed that a regular 75-cent can of Radiator Neverleak can be placed in a hand of the young woman's figure. This gives a very realistic look to the cutout and shows our package exactly the way it appears on the dealer's counter or shelf.

Furthermore, the cutout is fitted with a large and substantial easel, so that it can be placed in a window and kept in there for a long

time. It is mounted on exceptionally heavy stock and will not warp nor fade no matter how long it is left in a window.

We furnish all kinds of dealer helps—such as letters, circulars, folders, counter displays, window displays and even have special window display men who visit the trade and put in this material free of all charge. Any dealer who wants any assistance can certainly get it from us by return mail and everything we have of this nature is furnished free of charge.

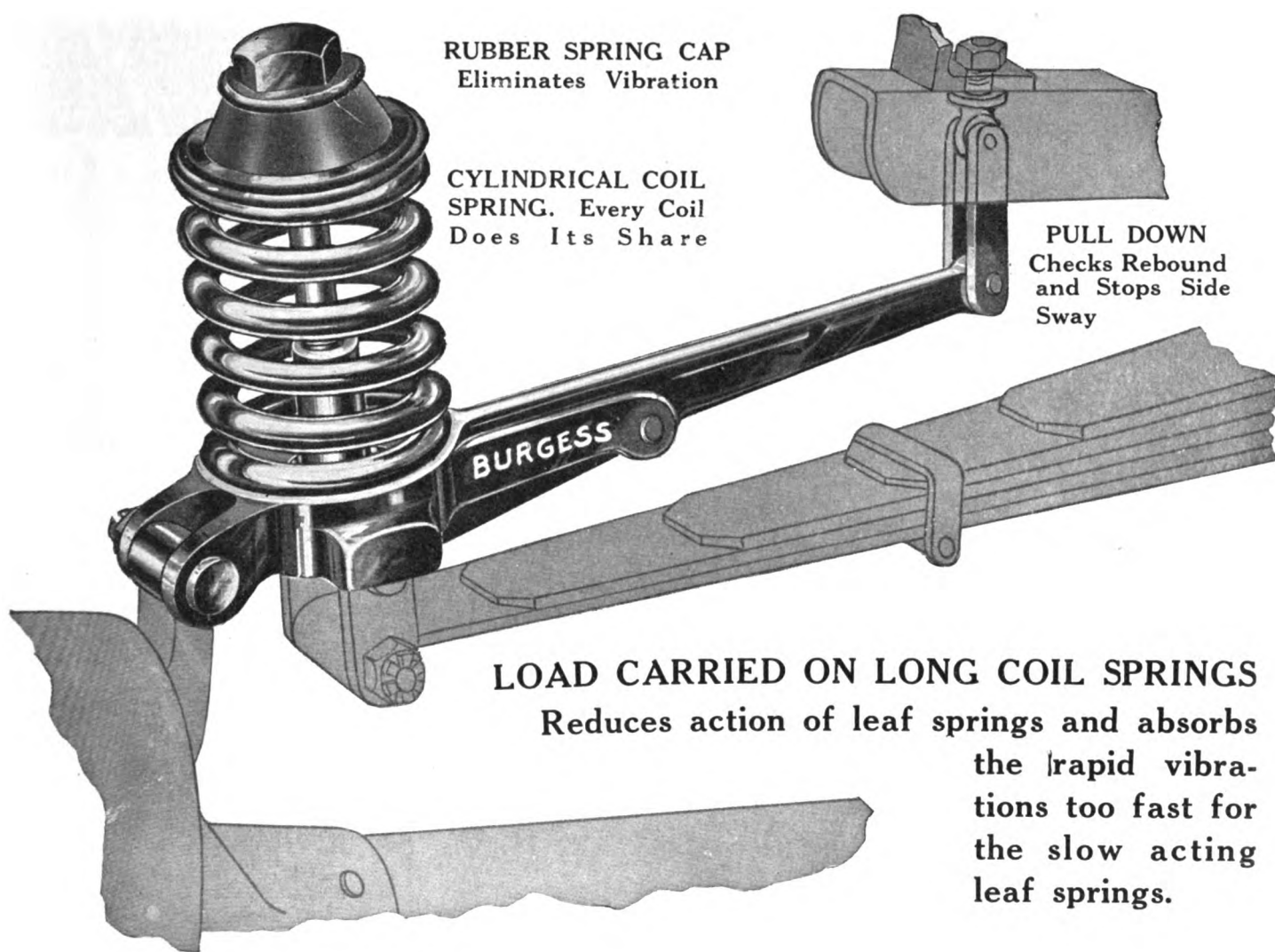
There isn't anything in the whole collection but what is exceptionally high class advertising matter, because we find it is simply a waste of money to furnish anything but the best.

LLOYD MANSFIELD, Advertising Department.



BURGESS

REBOUND CHECK and SHOCK ABSORBER



Does everything that all other Shock Absorbers are claimed to do, and many desirable things that none of them do.

Dealers write for details.

Manufactured by

THE WALTER S. BURGESS MANUFACTURING CO.

SALES DEPARTMENT

THE ZINKE COMPANY, 1323 So. Michigan Ave., CHICAGO, ILL.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Window Displays Win Profits and Cost Little to Arrange

Merchandise well displayed is merchandise easily sold, and this is as true of the wares of an automotive dealer as it is of the owners of department stores. In order to be effective, window displays need not be elaborate nor expensive. More sales are likely to result from simple displays than from ones which require the outlay of a good deal of money and the expenditure of a lot of time.

Automotive tradesmen who sell accessories—and all of them should—

and profit making window displays, and will furnish suggestions and ideas upon request without expense to the dealer.

Some good ideas as to window displays are outlined below in a description of three window displays furnished to its branches by the Goodyear Company.

Description of Branch Cord Tire Window Display No. 6461.

Cover the floor with black crepe paper.

In the front and center of the window, prop up a Cord tire window card as illustrated.

On each side of the card group three inner tubes as shown.

Directly behind the card, set up a large pneumatic truck tire with tread facing front. Lean three smaller tires on each side of the large one

sition, hanging in each one a small Christmas bell, and also placing in each one a tube as illustrated.

Then place a large cord tire in position, hanging a large Christmas bell in it, and place against it the special Christmas window card. The background then completes the display.

The white crepe paper, the green crepe paper and the red crepe paper, and the special Christmas cards have been sent to you. Please purchase from your local five and ten cent store two medium-sized paper Christmas bells for the small cord tires and one large-sized paper bell for the cord truck tire.

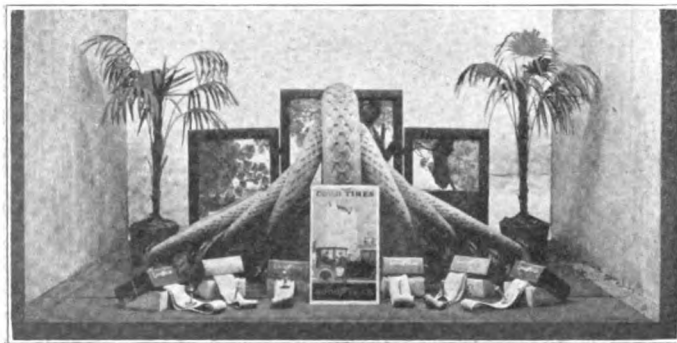
Instructions for Cord Tire Window Display No. 6502:

Cover floor with black crepe paper. Stretch a strip of orange crepe paper from each front corner of the window to the rear and center of the window.

Place a 35x5 cord tire in center of display and a 35x5 cord tire on each side. Arrange the accessories around the tires, as illustrated in the photograph.

Mount the advertisement we are sending you on a cardboard and prop it up in the center of the window as shown.

Set the palms and background in place. This display should appear in the window of your branch from January 4 to January 16.



Goodyear Display No. 6461

can arrange some neat displays in their windows without much trouble. One of the main things to remember is not to get too many different things into a window. If there are a great number of articles in a window the attention of those who see the display will become so divided up that sales are not as likely to result as when the articles are few in number.

Most of the manufacturers and jobbers of automotive accessories are willing and anxious to advise retailers how to plan and install sales bringing

as shown.

Set the palms and background in place and display is complete.

Christmas Window Display No. 6491:

Cover floor with white crepe paper.

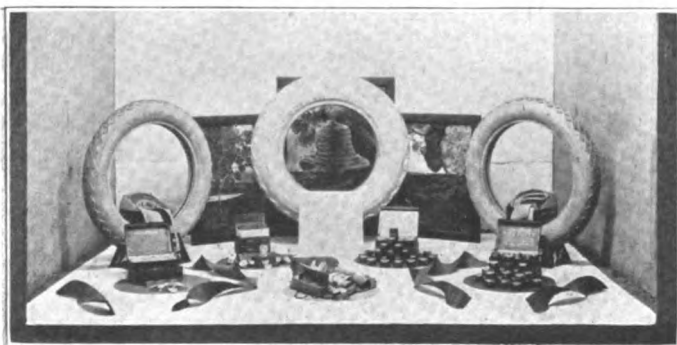
Cut five circles, each 20 inches in diameter, from green crepe paper, placing them as shown in photograph. You will probably find it advisable to tack the edges of these circles to hold them smooth.

Upon each circle place a carton of some Goodyear tire saver as illustrated in photograph.

Tack four short pieces of red crepe paper in position, twisting them a little to add to the appearance.

Next place the two 35x5 cord tires in po-

When a customer assures you that he will "Think the matter over," he is usually just making an easy "get away." Say pleasantly to him, "When you have given the matter full consideration, I will be glad to have you come back and see me. I am sure we can do business." This pair of suggestions with which the customer departs, will tend to bring him back of his own accord.



Goodyear Display No. 6491



Goodyear Display No. 6502

Of Timely Interest to Garages and Tire Shops

2 Valuable Machines in 1

NOW is the time to investigate this new Usaco unit. Don't wait until you have bought two less efficient machines at a greater outlay and then experience regret.

This new number combines an automatic air compressor and a buffer or grinder head into one compact unit so that either can be operated or both at the same time.

It saves the cost of one motor with shafting or countershaft, needs no special installation, conserves valuable space and renders satisfactory service far above the average.

The compressor unit is the **De Luxe** Two Stage compressor as found in a majority of the better establishments and the buffer or grinder head is of improved design.

We can also furnish this compressor without buffer but with double end shaft and pulley for driving separate buffer, drill press, line shaft or other small machine.

Get descriptive literature before making any arrangements regarding new equipment. Mail the coupon today.

**The United States
Air Compressor Co.**

6542 Carnegie Ave.
Cleveland, Ohio

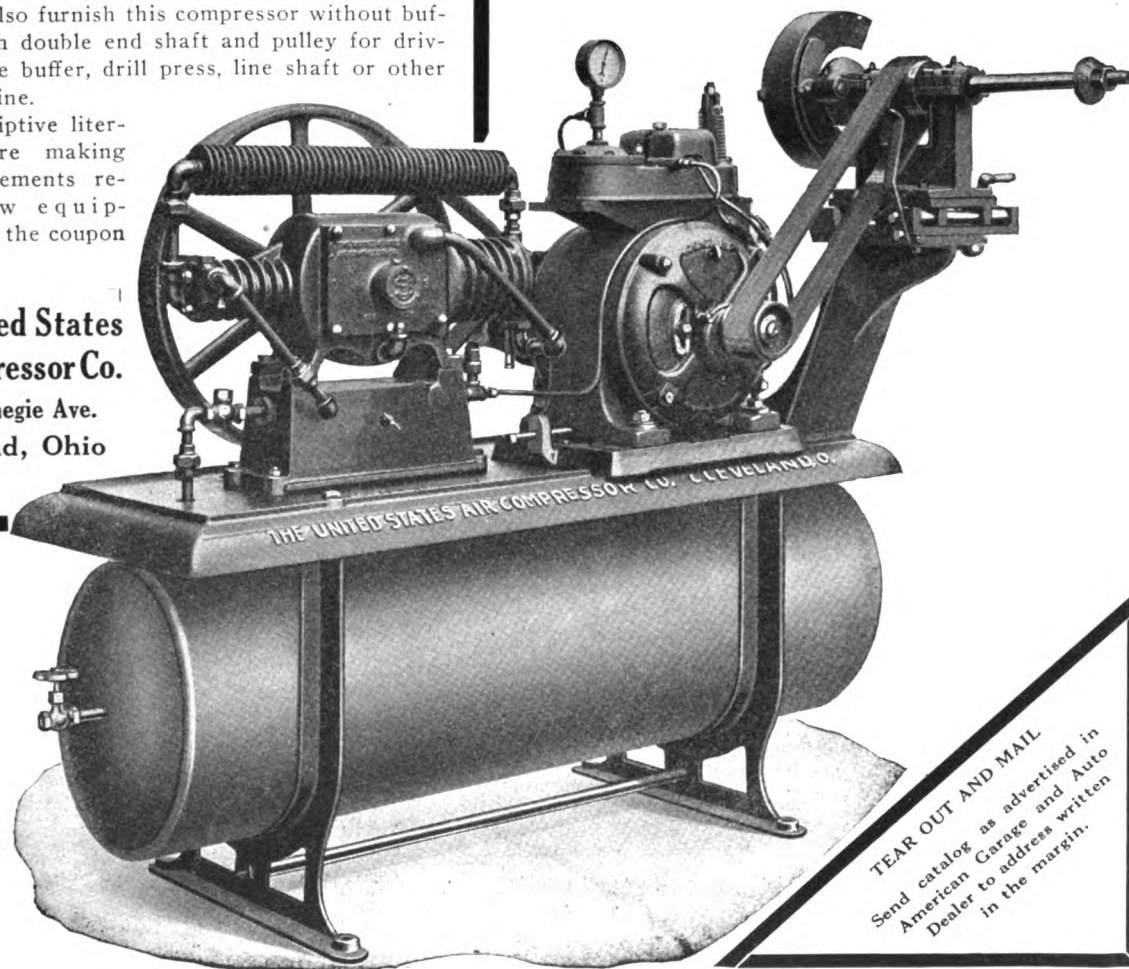
More Than
20 Different
Usaco Garage
Air Units in
Two Stage and
Single Stage
Types.

Send Coupon
for Catalog.

The DeLuxe
Two Stage

Usaco
AIR COMPRESSORS
TRADE MARK

Combined
Air Compressor
and Buffer



TEAR OUT AND MAIL
Send catalog as advertised in
American Garage and Auto
Dealer to address written
in the margin.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Welding, Cutting and Brazing

Care of Welding Equipment

By DAVID BAXTER

Hose.

The hose is the connecting link between the torch and regulators. Needless to say it should be good quality and proper length to be safe and efficient since it carries dangerously inflammable gas under pressure. It is not required to have a thick, awkward hose but it should be one constructed for welding purposes. The hose should be clamped to the torch and regulators by a clamp made for the purpose as it prevents the hose from being broken or cut, which is often the result of using wire.

Do not allow your hose to lie around in the grease and water on the floor; also do not drag it around—these things shorten the life of any hose. Pick it up and carry it from place to place or have hooks suspended overhead upon which to hang it when welding a job on the other side of the shop. When only a short length of hose is employed keep the balance coiled upon a hook near the tank, or coiled around the regulator; this does much to aid the lasting qualities of a hose.

Another trick I have noticed of expert welders is to keep the hose over their shoulders when welding. This effectually prevents them from walking on it. It also keeps it from dragging across molten bits of metal on the floor, especially when cutting heavy metal. The hose is allowed to trail down the back of the operator with a short curve by his side where his hose joins the torch. The thought strikes me that a sort of hook arrangement on the shoulder would improve this method.

Examine the entire length of the hose every once in a while, you may discover a broken place or a cut which would cause a bad fire if allowed to go without attention. A leaky hose is a menace to life and property, besides being an expensive luxury. Replace it before it gets dangerous. Do not use any kind of oil, paint, or dressing on the hose, keep it just as it comes from the factory.

The Torch.

As with other parts of his apparatus it is well for the operator to know the "insides" of his torch. Perhaps the best way to get a clear idea of the welding and cutting torch is to obtain a cross section drawing of it. There are so many different makes of torch that it seems inadvisable to attempt a detailed description of one. But if each operator has a drawing of his own torch he is better able to understand the "workings." Most makers are only too glad to furnish the drawings.

A torch of correct construction is made to permit the gas to flow through it with the least possible amount of friction or obstruction. Any rough spots or depressions in any of the tubes or joints will cause the flow of gas to be obstructed, thereby causing trouble with the flame, often causing it to flash back.

These flashings are in most cases premature combustion. That is, the gases are burning in the mixing chamber instead of at the tip. This premature ignition usually causes a carbon deposit which in itself is a cause of further torch trouble, and repeated flashing back. A number of flash-backs in succession sometimes roughen a part of the tubes so that more flash-backs are inevitable.

Although these flash-backs usually start from exterior trouble, they may start from something on the inside, such as a bit of the hose or other dirt in the line. One of the usual causes is overheating the torch, such as when the weld is made in a deep pocket or corner of a casting. The torch gets hot and the gas is ignited before it has a chance to reach the outlet. A remedy for this is to keep the torch cool by dipping it in water at intervals while working on this class of work. The dipping, however, should be done gradually.

Another cause of flash-backs is bits of the melting weld flying against the tip and sticking there, thus shutting off part of the outlet. Sometimes they may be scraped away by rubbing the tip along the surface of the casting. Care should be taken in doing this if the tip is very hot as brass or bronze breaks very easily when hot. Most torches and tips are made of these metals.

When it is necessary to remove bits of slag or metal from the tips with a file or grinder be careful not to shorten the length of the tip because they are usually the exact length for their make of torch.

A torch is not a hammer or a pair of tongs; do not use it as such. When not in use keep it hanging up in a clean, dry place. Do not allow it to lie upon the floor to be stepped on or get dirty. If it becomes clogged or dirty inside connect the tip to the oxygen hose or to a compressed air hose and blow the obstruction back through the torch. A risk is incurred if the operator attempts to clean the torch with a wire; he may cause an abrasion which will in turn result in torch trouble.

The welding and cutting tips should be considered in care of the welding apparatus. They should be kept in a rack or on a shelf to themselves. Sometimes they are ruined by the mere dropping of a file or other tool upon them. A nick is thus made in the outlet or a rough spot in the mixing channels, either of which is enough to put the tip out of commission. Do not remove

the tip from the torch while it is hot. And do not force a tip to fit, the threads may be battered and will spoil the threads in the torch. Also do not clean the tips with a wire, use a bit of waste or a cord.

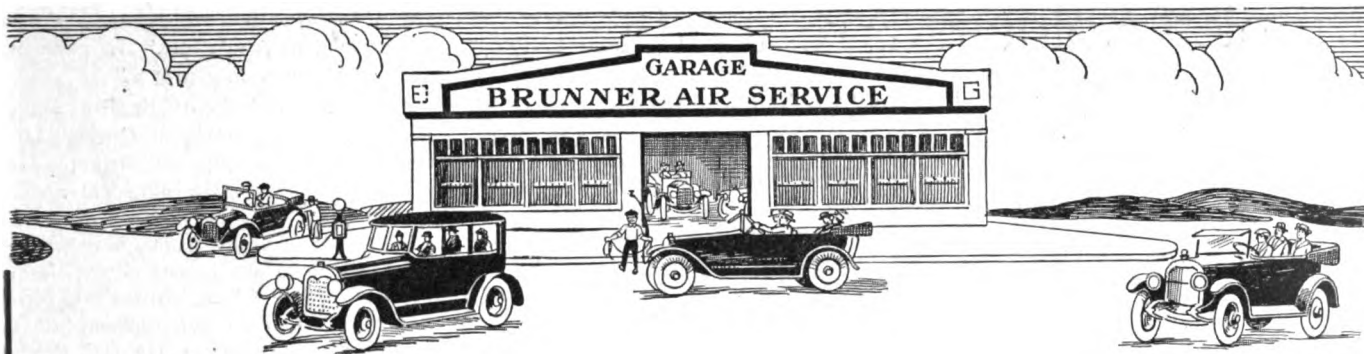
In closing this article on care of the welding equipment a few words on taking care of the operator may be appropriate. To do good welding the operator should also take care of himself. In the first place do not weld without eye protection. Smoked or colored glass goggles are the common form of eye protection. It is a good idea to have two or more pairs of goggles of different density of color. Use the darkest pair when employing the largest flame; the others for the smaller flame. To weld without them entirely makes the operator liable to serious impairment of vision. It is obvious that the eye is essential to any kind of welding.

Perhaps a few words on taking care of the shop will not be out of place. One thing, do not build heavy pre-heating fires on a cement floor. Besides ruining the floor it is a dangerous proceeding, I know of at least one instance where a large casting was being preheated on a cement floor and the fire had just gotten a good start when an explosion occurred. After the smoke and dust had cleared away it was found that a hole a foot deep and several feet in diameter had been blown in the floor. Whether it was caused from moisture in the cement or from some chemical process I am not prepared to state.

The floor was ruined, however, and the welder badly frightened and slightly burned in a number of places. If it is necessary to weld upon the floor it is better to remove a section of the flooring and arrange a special place for the preheating fire. This may be done by filling the place with sand.

Do not allow litter to accumulate in the shop, it may cause a slow fire which will burst forth at night and perhaps destroy the building. It is not a wise plan to store any stock of carbide or fuel in the welding shop. Keep these supplies in a separate room, be sure that it is a dry place for acetylene gas may be generated in the can if it happens to be defective and is rained on. The little "beads" or balls of metal that usually fall from the welds, especially the bronze and aluminum, should be gathered up. They are valuable—have a special box to put them in until a marketable quantity has been saved.

Colorado business men recently united in a movement for a \$10,000,000 bond issue. After getting well into the campaign they discovered their chief opposition was in a general criticism because they asked for too little. The bill now before the legislature calls for \$20,000,000.



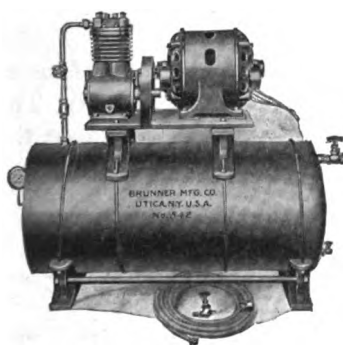
Make Your Air Service Pay

Your air service should not be just an item of expense. It should be your most profitable investment. The operating cost should be very small. It should require little or no attention and should be so efficient and dependable as to just naturally induce the motorists to gravitate to your garage because of the better service.

A Brunner compressor, either motor or belt driven—any one of the many sizes and combinations—together with a Brunner Open Hearth flange steel tank, with "Resistoil" air hose and Brunner fittings, is the answer to the air service problem.

BRUNNER Air Service is Dependable Economical and Profitable

A Brunner Motor driven outfit with a Brunner Automatic controller maintains automatically a proper working Air Pressure, saves you both time and labor, greatly increases the efficiency of your air service, and by reducing your upkeep cost, combined with the trade it attracts, makes the Air Service show a



This No. 542 assembled outfit consists of our No. 102 two-cylinder air compressor, a half horse-power motor, securely bolted to a cast-iron base, and mounted on a thirty-two gallon open Hearth flange steel air tank tested to 500 pounds.

With the outfit we furnish air gauge, check valve, 25 feet of "Resistoil" air hose, connected to a No. 82 needle valve on one end and having an automatic tire connection on the other. Can be furnished for either direct or alternating current, and when our Model M controller is used, the outfit will maintain the proper working pressure automatically.

profit instead of a loss. No outfit can deliver better air, give better or more consistent service or wear longer than a Brunner. The fact that Brunner Compressors were designed expressly for Garage use built of the best materials that money can buy in a plant manufacturing nothing but Garage Air Compressors, enables us to back up this statement. If you need more proof, ask any garage man in your town what compressor he would buy. His answer will be a Brunner.

Write for catalog No. 15, showing the most complete line of Air Compressors on the market and let us send you the name of the jobber covering your territory.



The Brunner Air Sign is your best Advertisement. It tells the Motorist of a garage service sure to please. Motorists have confidence in the garage that displays the Brunner sign.



We furnish free either the Brunner Air Sign or the Brunner Free Air Sign. Use whichever you prefer. The Motorist wanting gasoline, oil or repairs is more likely to look for the Brunner sign than for a garage sign.

BRUNNER MANUFACTURING CO.

GENERAL OFFICE AND PLANT: UTICA, N. Y.

CINCINNATI BRANCH: CINCINNATI, OHIO

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Crippled Soldiers Are Trained to Work as Motor Mechanics

By Douglas C. McMurtrie

Director, Red Cross Institute for Crippled and Disabled Men.

Motor mechanics has proved a most popular subject of instruction for crippled soldiers who are being retrained to become self-supporting, self-respecting workers. In fact, the trade is almost too popular, say directors of Canadian schools in which hundreds of disabled soldiers are today being trained in new occupations.

Practically every Canadian soldier who is asked to choose from among the various trades in which classes are operated, selects automobile mechanics. But most of the men have to be dissuaded from their intention and are turned into other channels of industry.

Canada, England, Germany and India are among the belligerents that offer training courses in motor mechanics to the disabled men of their own forces, and America, in line with the program of re-education that she has adopted, is teaching her wounded and disabled soldiers automobile repairing. At Fort McHenry, where the United States operates a large reconstruction hospital, one of the trades taught to convalescent soldiers is automobile mechanics. A one-armed or a one-legged automobile mechanic will not be a new thing under the sun once the general public has been committed to the principles of re-education.

Gasolene Engine Classes Formed.

In British Columbia gasolene engine classes were organized soon after the wounded began returning from overseas. Vancouver, Victoria, Esquimault and Westhaven provide instruction in motor mechanics. In Victoria the Military Hospitals Commission and the Board of Education together operate a fully-equipped motor repair shop in which men who wish to become chauffeurs are taught. Men trained in this course conduct a well-patronized jitney stand in the town. Those who wish a thorough course preparing them as motor mechanics are sent to Vancouver, and later to the new workshops at Esquimault and Westhaven.

The Military Hospitals Commission has made an arrangement by which war cripples at Vancouver are taught driving at an excellent automobile school in evening classes. Then, too, through the generosity of the owner of this school, any disabled soldier may attend his day classes free of charge. Several men from other parts of British Columbia are kept in Vancouver on a maintenance allowance while receiving training.

There is a big field for workmen in this trade in Saskatchewan, as through all the West, and thorough courses are given for

war cripples by the University of Saskatchewan. Another course is at the Provincial Institute of Technology and Art at Calgary. Disabled men so trained compete successfully with the average sound mechanic.

One Arm, But a Mechanic.

One soldier, who lost his right arm, is preparing with his chum to have a small flour and grist mill in one of the centers of the Peace River district. His course in automobile mechanics and gas engineering will enable him to take charge of the power plant (stationary gas engine), to

run a wood-cutting plant, and to mend automobiles as a side line. His chum will attend to the milling proper.

While the wounds of English soldiers and sailors are healing at Queen Mary's Convalescent Hospital at Brighton and Roehampton, they are afforded the opportunity of learning motor mechanics. The workshop at Roehampton is fitted up as a model garage in charge of disabled men who, besides being skilled instructors, understand the special problems of the war cripple. A motor chassis, working models of engines, three center drilling and turning machines, a drilling machine and benches fitted with the vises and tools needed in repair work are included in the equipment. An electric motor gives power for the machines. The class has a motor car for instructional uses.

Penlings from the Pen of Dike

(Not copyrighted)

The War is over, the Flu has Flew.

Now, Mr. Dealer, there's Heaps to Do.

Selling Gyp Tires is about like Selling Pointless Pins. You may sell a few but you can't repeat.

Mr. Owner, Mr. Manager, Speak and smile to all the employees, the first thing you do on entering your place of a morning and see how much more work you get done that day.

Nineteen nineteen will bring the Tourists out as thick as Locusts used to be in Indiana. Mr. Dealer make Ready.

The War is over. Say, what is some of these always excuse makers going to do when they don't have what the customer wants?

Some Dealers think because they sell a well advertised Line of Cars that they don't have to advertise. Well, Wake up Rip, The National Advertiser furnishes the Wind but you have to toot the Horn.

To Act Prosperous.

To Smile Happily.

To Answer Promptly.

To Advertise Steadily.

Shows the World that success has knocked at your door and you have let it in.

Man and Woman are alike

In many, many ways.

So Advertise to both of them.

For Advertising Pays.

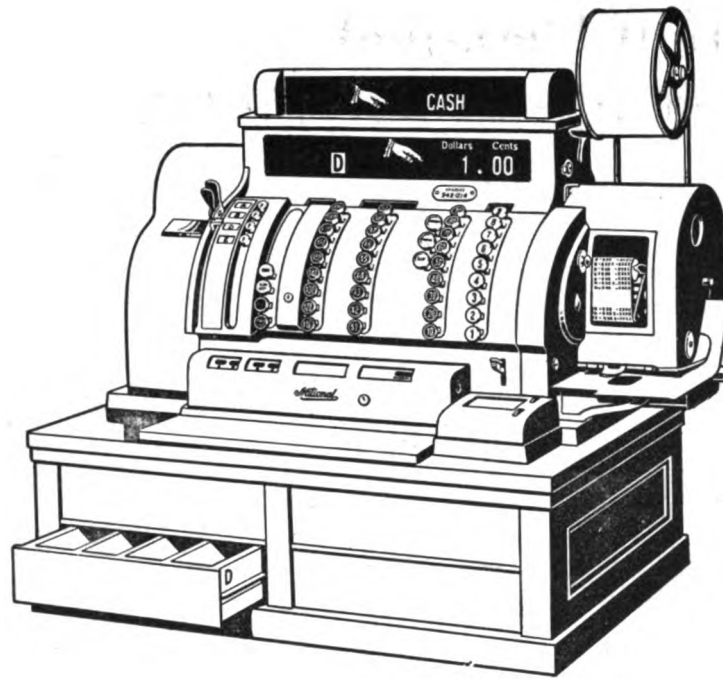
The Gink that says Advertising Don't Pay

Ought to take Liver Pills. He's got a Torpid Liver.

It may be late in saying Happy New Year to all the Readers. But Dike says it and Hopes every last one of you will be millionaires by 1920.

Stock Inventory is about over. Now take Inventory of your Faults and Try to get shut of them before February.

Keep a Warm Garage this winter and the Thermometer on the Cash Register will keep up at Normal.



The best improvement you can make

The best improvement you can make today is to install a modern National Cash Register—because it will build up and systematize your business.

A modern National Cash Register will raise the tone of your business, make your clerks more efficient, and put you in the class of up-to-date garage men.

It will enable you to save expense in running your business, and thus release money for other purposes.

It will make possible quick, accurate service

to customers—the greatest inducement that you can offer to get and hold trade.

It will give you unequaled protection, that will check every cent of your profits into the bank.

It will give you information that will enable you to control your business.

A modern National Cash Register is a garage improvement that will quickly pay for itself out of what it saves.

In the face of increased competition you cannot afford to postpone making this improvement.

The National Cash Register Company, Dayton, Ohio
Offices in all the principal cities of the world
Old registers repaired, rebuilt, bought, sold, and exchanged

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Standex System Designed to Save Lubricating Oil

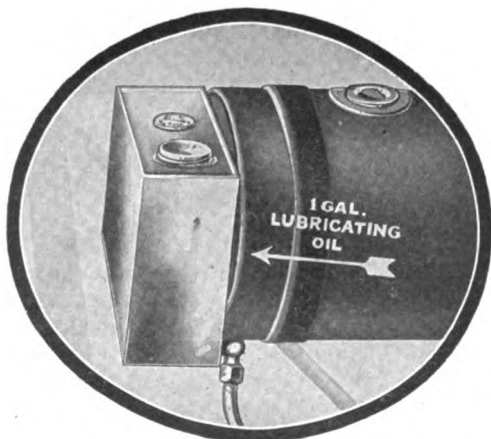
"Why a gallon—when a quart will do?" is the caption used by the Standex Manufacturing Corporation in describing its automatic lubricating system for Ford cars.

The makers claim radical economies in the consumption of oil. The fundamental purpose of this equipment has been the attainment of a positive and scientific control of oil level in the motor of the Ford.



After several years of experiments and mechanical laboratory tests the concern announces it has succeeded in producing a lubricating system that will make a quart of oil serve for as much mileage as has heretofore been obtained from a gallon.

The Standex system embodies a one-gallon oil reservoir, fitting snugly at one end of the gasoline tank compartment under front seat, as shown in illustration. In the center of the top of this reservoir is provided an accurate gauge indicating oil reserve. From the reservoir is a quarter-inch copper tube leading forward, with one turn around exhaust pipe, to the control-chamber—that automatic and infallible guardian of the oil level in the crankcase. The copper tubing has solderless connections; no soldering or drilling.



Within the sturdy glass wall of the easily installed control-chamber a vacuum cylinder or float is caged between upright guide rods. Above this float is mounted

a steel ball which, when the float rises, enters and seals the valve in top of control-chamber against the entry of oil from reservoir. This control-chamber is mounted at a point exactly in line with the oil level prescribed as ideal in the Ford motor.

As the oil level in the crankcase recedes the fraction of an inch, the float in the chamber is similarly lowered; in doing so the ball valve is opened, admitting sufficient oil to bring crankcase level to normal, at which point valve again automatically seals.

Besides effecting a radical saving in oil consumption, it is claimed that the Standex system minimizes sparkplug fouling and carbonized cylinders and produces a smoother running motor.

V. N. Hansen, president of the Standex Manufacturing Corporation, is well known in the automobile field. He was sales supervisor of the Stewart-Warner Speedometer Corporation for several years and previously was president of the V-Ray Company.

New Era Spring Firm Plans Big Business

President W. Smalley Daniels of the New Era Spring & Specialty Co., at Grand Rapids, Mich., announces a big advertising campaign to help the concern's dealers sell the New Era "Better" motor requisites. Three advertisements are ready to be used in this consumer campaign in March, April and May.

The New Era concern will feature its bumpers, tire carriers and springs in the advertising to motor vehicle owners.

The Small Town Post-War Market

There are 68,707 towns in the United States with less than 10,000 population, and two-thirds of the entire population of the United States lives on farms and in these towns up to 10,000. Considered together with these figures should be the fact that the total value of all farm products for 1918 reached the stupendous sum of twenty-one billion dollars.

Statistics make dull reading and leave little impression. It takes more creative imagination than anyone possesses to conceive of millions of individuals, millions of homes, thousands of towns. Therefore the concept or symbol known as "the average," which in reality does not exist at all, is so convenient and acceptable.

It is impossible to visualize these 68,707 villages throughout the length and breadth of the country, fringing the coast line, dotting the plains, nestling in the mountains. One can picture two or three or a half dozen small towns with which one is personally acquainted, but in so doing fail to grasp the potentialities of over 68,000 of such towns.

Manifestly the total amount of money spent in the towns of 10,000 or less is enormous. The farm family naturally purchases a goodly amount of its needs in the nearby town, just as the residents of the town buy within their own boundaries. This means that two-thirds of the population of the country—over 66 millions of people—trade in centers which individually seem so insignificant, that the manufacturer seeking national distribution for his product is prone to overlook them.

For obvious reasons the centers of concentrated population are the most conveniently covered by salesmen and by advertising, which fact is no argument for neglecting this market where 66 million buy.

With the advent of peace the potentialities of the small town market are greater than ever before. Because of their quieter, less complicated life, the small towns have probably concentrated more than the cities and larger towns on war-saving and war-giving. They have invested lavishly in liberty bonds and thrift stamps. They have saved money and conserved food, clothing and other commodities. They have built no new homes, nor rebuilt old homes.

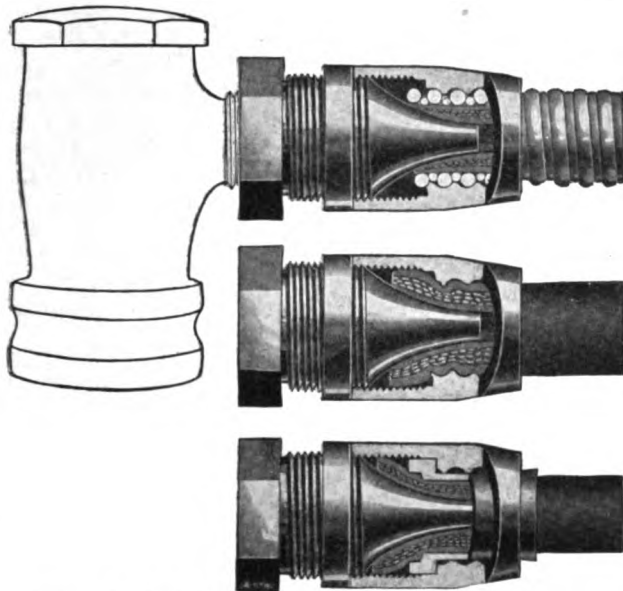
But other equally important changes have taken place in the small towns during the period of the war. Brought into closer contact with the great outside world by the war, their people have acquired new ideas, new interests, new demands.

Today with greater accumulated savings than ever before, with wider viewpoints, and with the strain and stress of the war removed, the small towns of the country represent a highly prolific field of trade which thus far the national advertiser has scarcely scraped.

—Judicious Advertising.

ROMORT

AIR HOSE
UNIVERSAL
COUPLING



**ONE COUPLING
to meet the
demand for
ALL SIZES**

The ROMORT Universal Air Hose Coupling takes all sizes of hose as illustrated, or any hose from $\frac{5}{16}$ to $\frac{3}{4}$ inches, outside diameter, whether plain or armored.

The other end of the connection is a $\frac{1}{4}$ inch thread and fits all ROMORT Automatic Air Valves or other standard connections with standard $\frac{1}{4}$ inch pipe threads.

The ROMORT Universal Coupling is made of high duty brass with a white nickel finish.

It can be attached to any hose in a minute and positively cannot leak.

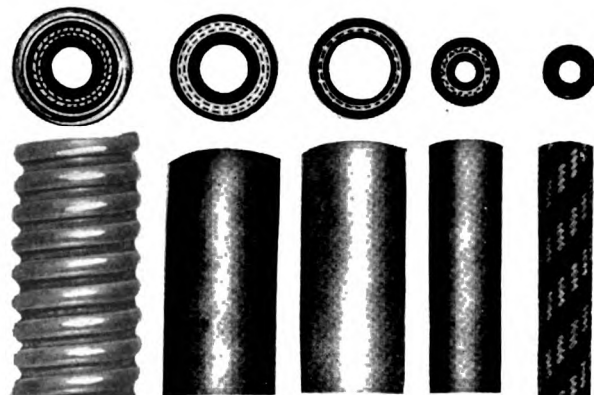
The ROMORT Universal Coupling can be changed from one size of hose to another size at any time.

This is an ideal proposition for jobbers and dealers.

Instead of several different sizes to carry in stock there is but one size ROMORT Universal Coupling.

We have a proposition for jobbers and dealers that is mighty interesting.

Write for details.



Manufacturers

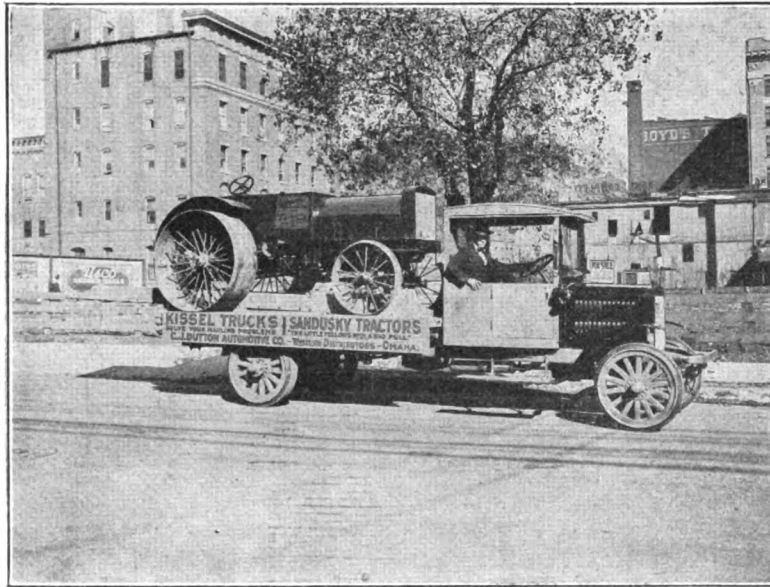
ROMORT MANUFACTURING COMPANY
Oakfield, Wis., Chicago, Ill.

Sales Department

THE ZINKE COMPANY
1323 S. Michigan Ave., Chicago, Ill.

Automotive Dealers Take Tractors to the Farmer

A very great reaction is occurring in the tractor selling field today. This, no doubt, is being brought about by the fact that the sales end of this business is gradually readjusting itself to its natural outlet—the automobile distributor and dealer.



Naturally this has introduced many novel and interesting sales innovations. Unlike the more staid and less progressive agricultural implement dealer the automobile distributor and dealer has had the advantage of using highly trained methods of selling and advertising. As a result he has found marked success with this item.

A very good example of this is shown by the accompanying illustration. The C. J. Dutton Automotive Company, at Omaha, Nebr., distributors of Sandusky tractors and Kissel trucks, take the tractor on one of their trucks from dealer to dealer, demonstrating both machines at one time as well as creating considerable attention en route. They report exceptionally large sales by this method.

The measure would provide for 17 routes, six of which would be trans-state thoroughfares from east to west, including the Lincoln Highway, and the entire system practically connecting every county seat in the state.

The suggested bill proposes the setting aside of all automobile license fees to pay the principal and interest on the road bonds

factory is located at 18th and Izard streets and was erected especially for the Sprague concern. President E. H. Sprague of the company said that the concern's cores and moulds are over size and that it is using an extra ply of fabric.

A year ago when the company was organized and the men interested started to sell the stock they were able to dispose of the entire million dollar issue in 95 days, which was a record performance for Omaha. This success in raising money was probably due to the fact that President Sprague has been engaged in the rubber business in Omaha for the past 20 years and is well known to business men all over the state of Nebraska. Mr. Sprague is very proud of the fact that, in less than one year the capital was raised, the building erected, equipped with machinery and the production of casings and tubes instituted.

By the way, what is YOUR vision of what you want to be and to do and to have, tomorrow, a year from tomorrow, five years from tomorrow? The man without a vision spends himself like bird shot; the man with vision organizes his own faculty and forces so as to actualize that vision at the earliest possible moment. Don't be a drifter! It doesn't pay.

as they fall due and provides that whenever the funds from this source are found insufficient to meet current obligations, the Secretary of State be authorized to increase automobile license fees by 25 per cent, this being augmented, if necessary, by a direct annual tax.

Some such measure will undoubtedly receive state-wide approval in Iowa, long notoriously one of the "mud states" of the Union.

Sprague Tire Company Plant in Production

The Sprague Tire and Rubber Co. has started the production of Sprague casings and tubes in its new plant at Omaha. The

Pablo Homs has been appointed assistant foreign sales manager for the Cleveland Tractor Company of Cleveland, Ohio, with offices at 44 Whitehall St., New York City. He is qualified to take up this work because of wide experience in the sales promotion of agricultural machinery in foreign lands. His record in this line dates back to 1901, from which date up to the present time he has been prominently associated in the development of export business in the agricultural implement, motor car and motor truck lines with a number of America's largest institutions.

Fifty Millions for Roads Now Proposed in Iowa

The Moline Dispatch, in a recent issue, remarks that the action taken by Illinois in overwhelmingly voting the passage of the sixty million dollar bond issue, for the construction of a 4,800 mile system of state-wide permanent highways, is having its natural effect on the neighboring state across the Mississippi.

A fifty million dollar road system for the state of Iowa has been mapped out by Representative-elect Frank Nebiker, of Burlington, and will be presented for the consideration of the legislature of the great farming state.



NEW SPRAGUE TIRE PLANT.

SHALER

5 MINUTE GARAGE VULCANIZER



Makes 4 Repairs in 5 Minutes

This new gang vulcanizer was designed especially to meet the demand from Garages and Repair Shops for a quick action, large capacity, dependable vulcanizer, that uses the convenient Shaler Patch-&-Heat Units. These handy units are very popular. Over 10,000,000 punctures were repaired with them last year. No other method is so quick, safe, convenient and satisfactory.

The Shaler Patch-&-Heat Unit—always ready for instant use—saves time and prevents delay. It is a complete unit—a compact combination of chemical fuel, vulcanizing pan and raw rubber patch. You simply remove the linen protection from the patch, clamp it over the puncture, light the fuel, and in 5 minutes you have a permanent, feather-edge repair, stronger than the tube itself—one than you can guarantee.

Free to Repair Shops

To quickly introduce this wonderful new Shaler Garage Vulcanizer—we will send *Absolutely Free*, with each outfit—an assorted supply of Shaler Patch-&-Heat Units, that will make repairs enough to more than pay for the outfit.

Our low List Price \$10 is subject to 30% trade discount, making the Net Price to you only \$7—and with the outfit we will send you Free Patches enough to more than pay for it, so that outfit costs you practically nothing.

You can obtain garage size, Large Packages of Shaler Patch-&-Heat Units from your jobber, at prices so low as to make this the cheapest method of vulcanizing. And there is no danger—no gasoline, no blaze, no flame, no trouble, no waiting to heat a vulcanizer.

Write Quick—or Ask Your Jobber

for full information about our Liberal Introductory Offer. This is a limited offer, for a short time only, to introduce this new Garage Vulcanizer. Take advantage of it now. You risk nothing, because we will send you Free Patches enough to more than pay for the outfit. Write now, and give us your Jobber's name, for full information.

C. A. Shaler Company, 364 Fourth Street, Waupun, Wis.

ROUND
PATCH
1 3/4 INCH

OBLONG
PATCH
1 3/8 x 2 1/4 INCH

EX-LONG
PATCH
1 3/4 x 4 INCH

Tractors and Farm Lighting

Tractors can be used in many ways in addition to hauling various kinds of agricultural implements over cultivated ground. Motor tradesmen who are considering taking on the agency for a tractor should realize their list of prospective purchasers is not limited to owners of big farms alone. Tractors are now being used as emergency switch-engines in big manufacturing plants and there are numerous other tasks they can perform if only the tractor dealer will study ALL the possibilities of their use.

Not only can tractors be employed to advantage on land where horses, mules and oxen have been used but there is an even wider field for their use. This is well brought out in an article in the Capper Bulletin reading as follows:

Tractor sales are not limited to horse-farmed land. The usual estimate is that 1¼ million tractors will be used in the United States on the land now worked with the horse, and it is also implied, if not definitely stated, that there will be a decrease in the number of horses. In fact, there actually has been some comment and wonderment as to why the number of horses in the last two or three years has not been decreased by the sale of 60,000 to 75,000 tractors.

Tractor Supplements Horse

The truth about the matter is that the tractor will supplement the horse rather than displace him, handling bigger jobs, on land now cultivated, more quickly and in more seasonable weather, and in addition opening up much new farm land.

There are at present about 470 million acres in the United States in actual cultivation, less than one-fourth of the total area. The horse and ox, when introduced by man for farm power, brought a gradual and extensive development to agriculture; new land was broken, the number of farms increased, larger farms developed and fields became larger as man's work was supplemented by animal power. Just so should the tractor, in

supplementing horse power, again increase, and more rapidly, the area and number of farms as well as the size of the fields.

There are more than 60 million acres of swamp land in the United States, which the Secretary of the Interior estimates can be converted into farm land. Extensive ditching, tiling, and deep tilling is necessary. All this the tractor can do. Machines can be operated by tractors in this soft land where horses would mire down.

Can Pull Stumps

In the timber districts the tractor also has an opportunity. There are 200 million acres of cut-over land awaiting development. The tractor can give the excessive amount of power required at infrequent intervals for pulling stumps and plowing up heavy roots, as well as leveling the land after these operations. The belt pulley makes easy the drilling of large stumps for blasting and the sawing of the waste timber.

Still another possibility for the extensive use of tractors, and undoubtedly the most immediate, is found in the Western plains district where the rainfall is light and evaporation is heavy. Very little of the United States with a rainfall of less than 20 inches a year has been made productive.

Yet wheat is produced in China on land with less than 10 inches of rainfall. This is because an excessive amount of labor has resulted in more thorough cultivation than much of our Western land has received, or can receive with the horse for farm power. There are about 250 million acres of this so-called semi-arid land where the rainfall is sufficient but the evaporation excessive. The tractor as a conserver of moisture, having ability to plow deep and to handle large areas quickly and in season, can lower the rate of evaporation on this soil, store more of the moisture for the crops, and carry agriculture well up to the foothills of the Rocky Mountains.

In addition there are the undeveloped tropics where millions of acres of luxuriant plant growth will create a tremendous food-stuff production. The excessive heat and humidity of the tropics makes animal labor impracticable.

Tractor Trade Attracts Automobile Distributors

While the Chicago automobile show was primarily devoted to the passenger car and allied industries, the distributors and dealers who visited Chicago had an opportunity to gain a more detailed knowledge of the possibilities of the tractor business.

The Parrett Tractor Co. of Chicago has been brought in close touch with a number of the largest automobile distributors and dealers throughout the country. Many of these men realize that they need a better rounded line of automotive machines to sell in order to keep their organization fully occupied all of the time as well as to derive the full sales possibilities from their respective territories. The motor truck was an important addition and now the tractor offers great possibilities. But they want to know more about the tractor business.

Recognizing the mutual advantage to be gained by coming in contact with automobile men from all parts of the country during Chicago show week, the Parrett concern established headquarters at the Congress Hotel with Frank H. Smith, well known in the automobile industry, in charge.

A conspicuous feature to impress the visiting automobile men with the potentialities of the tractor business was the exhibition of a Parrett tractor mounted on a truck which moved up and down the streets so that all could see it.

In commenting upon his experience during show week, Mr. Smith said, "The amount of interest shown by distributors and dealers in the possibilities of the tractor was remarkable. They are well aware that it holds great potentialities for them and they seemed anxious to learn just how to go about the business. I was surprised at the number who are making plans to take on tractors during the present season."

Lindsay Brothers had a tractor exhibit at the recent automobile show in Milwaukee. The number of automobile dealers who were interested in tractors at Milwaukee was a revelation to them; and consequently Lindsay Brothers are very much impressed with tractor sales possibilities.

STORM

MOTOR REPAIR EQUIPMENT

YOU Garagemen and Repairmen can cash in **BIG** right now if equipped with **STORM** Tools. The entire **Storm** line is designed to add to your efficiency and increase your profits. Each of our tools is made in a size and capacity to fit your needs. They have all been tested, approved and recommended by factories and repairshops throughout the world.

STORM CYLINDER REBORING MACHINES

enable you to rebores cylinders of Automobile, Truck, Motorcycle, Marine, Tractor and Stationary Motors of the sizes in common use.

STORM VALVE PORT RENEWING TOOL

is the only tool made that will renew the entire Ford valve system complete. Enlarges the Port. Makes a New Narrow Seat and a New, Accurate Stem Guide.

STORM BEARING REAMER JIG AND GAUGE

makes accurate fitting bearings and insures **PERFECT ALIGNMENT**. With it your cheapest man can do expert bearing work.

STORM PISTON VISE

holds the piston firmly without injuring it. It's a time saver.

NOW is the time to install **STORM** Tools and keep the profits on all cylinder, piston valve and bearing jobs in your shop. Let **STORM** tools help you build up a better reputation for first class work. **Storm Products are sold by leading jobbers everywhere. We furnish Pistons in any oversize for any make or size of motor.**

A. G.
& A. D.

**Storm
Mfg. Co.**

Thompson, Ia.

Send Catalog 30.

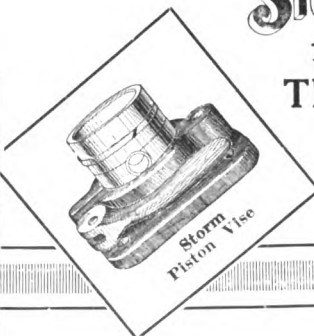
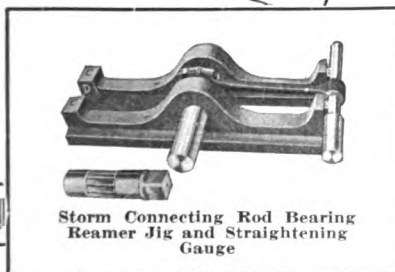
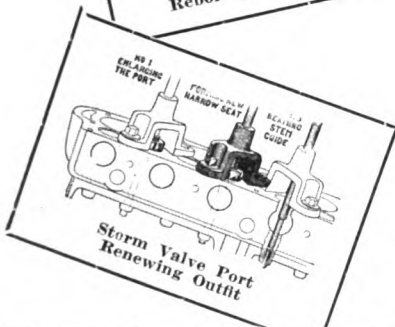
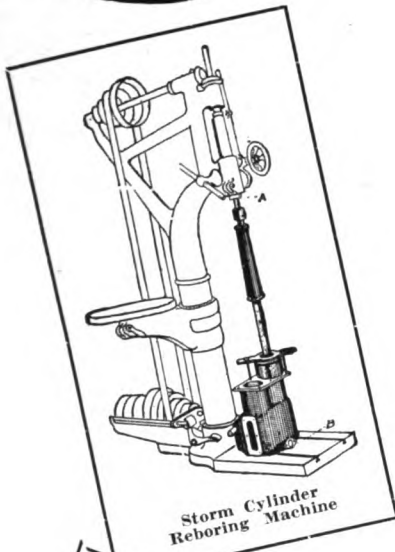
Interested in:

- ☐ Reboring Machines
- ☐ Piston Service
- ☐ Valve Port Renewing Tool
- ☐ Connecting Rod Jig
- ☐ Piston Vise

Name

Address

Your Jobber's Name



Give the **AMERICAN GARAGE AND AUTO DEALER** Credit When Writing Advertisers.

Accessories and Garage Equipment

CORK INSERT CELEBRATES ITS SECOND BIRTHDAY.

Cork insert transmission lining for Ford cars recently celebrated its second birthday. During its two years on the market it has set a pace for growth that many believe is a record. It is now in use by over 500,000 Ford owners. It makes the Ford work smoother and saves wear and tear on the Ford rear end.



Ordinary transmission fabric soon loses most of its frictional qualities. As the result of soaking in oil, pressure and friction, it becomes so hard and polished that when it comes in contact with the transmission drum the effect is like that of one polished metal body against another. The result is slipping, chattering and vigorous vibration that racks the rear end of the car to pieces.

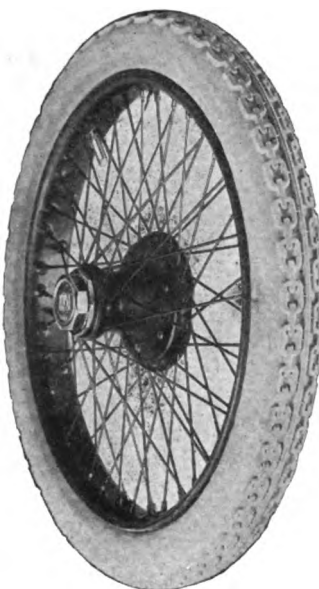
Cork insert transmission lining overcomes the shortcomings of ordinary lining. Into the very highest grade transmission fabric, buttons of cork are set. The corks project slightly. When pedals are pressed the corks engage the drum first, then compressing, ease the load onto the lining with smooth, steady friction. Cork has the highest co-efficient of friction of any solid. Cork insert is sold in sets of three in the black and red package by Advance Automobile Accessories Corp., 56 East Randolph St., Chicago.

BIGGER PASCO WIRE WHEELS TO BE MANUFACTURED

Sales Manager H. E. Van Horn of the National Wire Wheel Works at Geneva.

N. Y., announces that his concern is preparing to produce larger wire wheels for big cars, similar in construction to the Pasco wire wheel for Fords. Chevrolet and Overlands. Arrangements have been made for a daily production of at least 1,000 wheels a day, this number to be increased to 3,000 wheels per day by June 1.

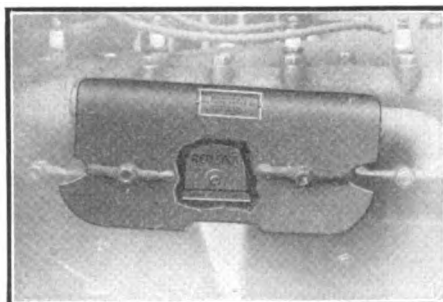
It is the concern's intention to open up service stations through the United States. The first ones will be established in Chicago, Detroit and New York City in order to give immediate service to all Pasco wheel owners. One of the features of the new Pasco wire wheels is that they give the same standard 56 inch tread as when wooden wheels are used. Before Pasco wire wheels are assembled and enameled they are treated with a rust-proof solution which prevents them from rusting when in use.



RED SPOT HEATER SAVES MONEY ON GASOLINE BILLS

The increasing lower quality of the gasoline offered to motorists has caused much experimenting to be directed to methods of vaporizing fuel. Careful tests have shown that from 20 to 40 per cent more efficiency per gallon of gasoline is obtained from an engine with a hot spot. Also quicker, easier starting and almost immediate smooth running of the engine after starting. These facts are true not only in cold weather but are very noticeable in warm weather, as well.

The Ford was one of the three cars at the recent Chicago show which did not have a hot spot. To furnish this equipment and put the gasoline mileage of the Ford up where it used to be when fuel was better than it is now, the Axleford Truck Company, of Chicago, has been experimenting for more than a year and tested for the past six months the Red Spot manifold-heater. This simple little device is adjustable for hot or cold weather, can be installed by anyone in less than 5 minutes and will save from 50 cents to one dollar on every tankful of fuel.

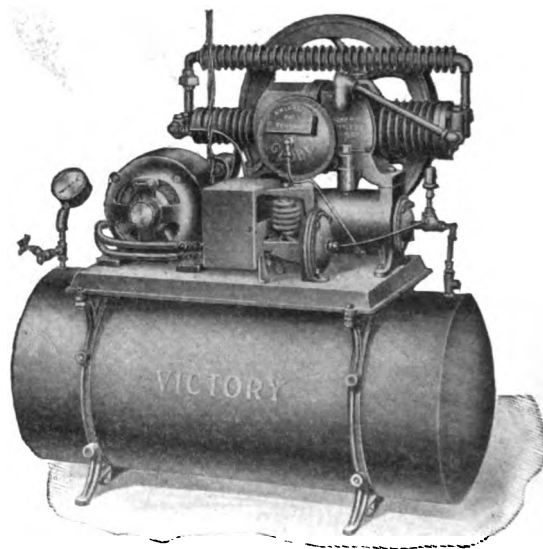


The Red Spot manifold-heater consists of the Red Spot and an asbestos lined cover. The Red Spot connects the intake and exhaust manifolds and forms a hot spot at the top of the intake manifold just where the incoming mixture of gasoline must strike. This hot spot thoroughly vaporizes

the fuel and makes a dry powder producing gas, the thing all the engineers are striving for. The cover is provided so that in cold weather the blast of cold air from the fan will not chill the forward end of the intake manifold and condense the mixture going to the front cylinders. The cover can be taken off in two minutes in hot weather, when it is not needed. Only two nuts are loosened to install the Red Spot manifold-heater. No holes are cut in the engine or manifolds. The manufacturer, the Axleford Truck Company, 1610 S. Michigan Ave., Chicago, will be glad to send full details to anyone mentioning American Garage and Auto Dealer.

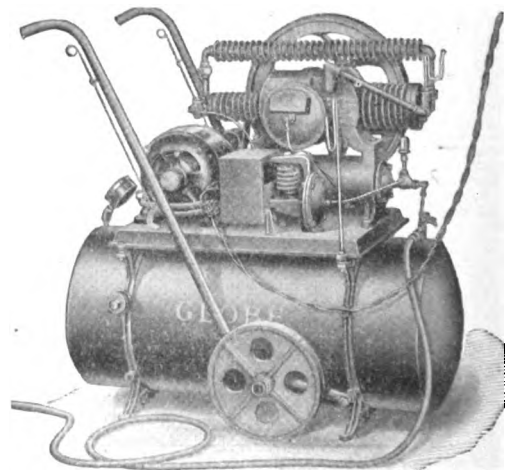
GLOBE FIRM HAS NEW VICTORY AIR COMPRESSORS

Two new Victory air compressors have just been put on the market by the Globe Mfg. Co., at Battle Creek, Mich. Each machine is a complete automatic motor drive unit.



The Victory stationary compressor unit is substantially mounted on a steel air storage tank of ample capacity for the average garage, tire shop or free air service. The floor space required is 19" by 40". It is fitted with a 300 pound pressure gauge with needle valve, 25 feet of air hose with air chuck, brass taper connected and needle valve attached.

The Victory portable machine is the same as the stationary unit except that it is mounted on a truck attachment. Except when being moved about it is virtually a stationary outfit, as it rests on its four feet, with no weight on the wheels. It may be moved by depressing the handles, which raises the unit from the floor.



Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

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.....

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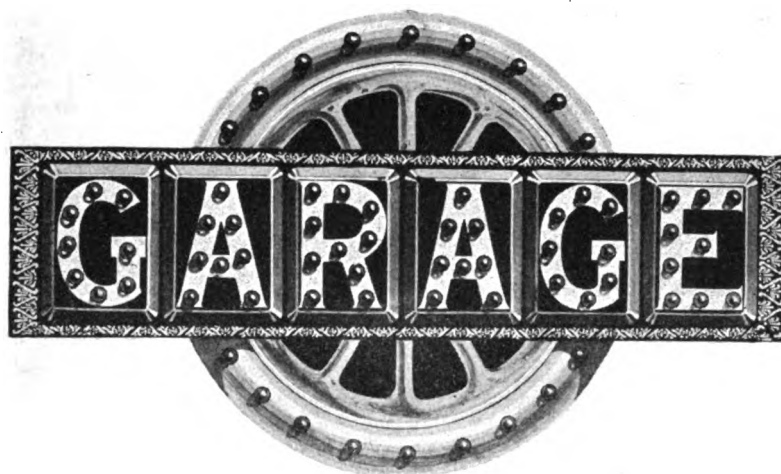
Name

Address

Which is YOUR Garage



Give New Customers a Chance to Find You—Use a
FEDERAL ELECTRIC SIGN



Works 24 Hours a Day

The Federal Electric Sign is attractive by day and brilliant by night. It can be seen from a distance. New as well as regular customers can find your garage without difficulty. This beautiful, sparkling sign gives a cheerful and prosperous appearance to your garage—it draws trade like a magnet. It creates the impression that you are ever ready to give up-to-date service.

Twelve Months to Pay

The first payment brings the sign—you have 12 months to make the final payments and you get the service of this energetic salesman while paying for it. This sign cannot fade, rot or rust—it never needs refinishing—an occasional washing keeps the porcelain surface sparkling like new.

Commonwealth-Edison Company

Edison Building, 72 West Adams St., Chicago, Ill.

If located outside of Chicago, address

Federal Sign System (Electric)

Lake and Des Plaines Streets, Chicago, Ill.

Small Weekly Rental Basis

If you are located in Chicago or in a large city where we maintain a service department, you can rent the Federal Sign on a weekly basis, which includes sufficient current to operate sign.

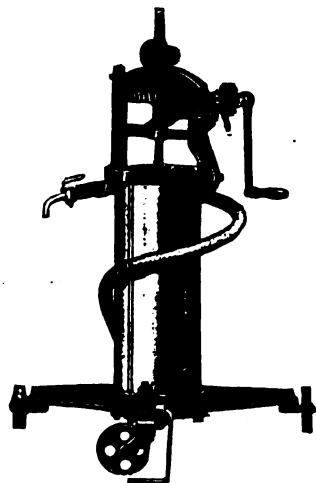
—Send This Coupon Today

Please send me full particulars of a sign suitable for my business.
 Store frontage
 Name
 Address
 Business (AGAD)
 No. of floors.....

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

NEW GARAGE GREASE GUN MARKETED BY PARO FIRM

Ekern's new portable grease gun, model N, has just been put on the market by the H. G. Paro Co., 1410 S. Michigan Ave., Chicago. It has a capacity for 56 pounds of grease or 7 gallons of oil. It is mounted on a three-wheeled standard to facilitate moving from around a garage or service station.



The gun is fitted with a register which will show the exact amount of grease or oil discharged. When grease is used it registers in pounds and it registers oil in pints. It is especially useful where large quantities of grease or oil are handled, as in garages or service stations where trucks, tractors or taxicabs are cared for.

RED STAR TIMER FOR FORDS.

The timer of Ford cars has always been more or less a source of trouble. In fact, this has developed to such proportions that the demand for a timer that would really wear has followed automatically, and this is the reason why the Red Star timer for Fords has gained quick favor with the Ford public.



In building this timer special attention has been given to the parts that wear out the quickest, namely, the race and roller. The Red Star timer race is made of the best quality bone-fibre. It is natural color and cured until it is very hard and durable. It is also made of one piece throughout and not built up in layers. Therefore, crumbling and coming apart are impossible.

The roller of the Red Star timer is designed to roll under all conditions. The roller on a roller principle is applied giving virtually a roller bearing roller. This reduces wear to a minimum and tends to give extremely long life and lots of service. Each Red Star timer is stamped with a Red Star right on the timer shell. This is quite an innovation in Ford timers and the company are featuring it in all of their advertising. It marks it as their own products and is a precautionary measure against substitution. It is manufactured by Auto Components, Inc., 56 East Randolph St., Chicago.

WHITE STRIPE LINING SOLD IN BOXES AND ROLLS.

The service which transmission lining undergoes in the Ford car is very severe. It is subjected to scalding oil, burning friction, and great stresses in bringing the car to a stop. Under this kind of treatment it is no wonder that fabric should become hard and polished and then be unable to deliver efficient work. To provide a better transmission lining, the engineers of the Advance Automobile Accessories Corporation have worked out a treatment and a method of administering it which results in increased efficiency and life. This treatment, it is claimed, permeates each thread of the fabric and protects it better from the scalding oil than anything else ever devised. The effect of this better protection is obvious. The oil cannot penetrate the fabric, harden and cause it to become stiff and unresponsive to pressure. It stays soft, presenting a good braking surface to the drum of the car for a much longer period than ordinary lining.



White stripe lining is unique in that it is the first transmission lining for Ford cars which has been identified by a distinctive marking so that it can readily be identified whether it is sold to the Ford owner from the roll or in boxes. Manufactured by the Advance Automobile Accessories Corp., 56 East Randolph St., Chicago.

SAVIDGE VALVE LATHES DO THEIR WORK QUICKLY

The Savidge universal bench valve lathe is said by its maker to be a simple, rugged, accurate, efficient and quick machine with a real lathe action so necessary for many valves with steel heads. It is claimed to be quicker and more accurate than a machine lathe because it is self centering and the angles are accurately fixed.

With this machine the valves can be trued up in spare minutes, and a perfect concentric fit is assured which saves valve grinding. It is declared that instead of the usual ridges made by grinding this Savidge machine leaves a smooth, non-carbon surface. It is operated by turning the valve with a crank while operating the feed screw with the left hand.

The Savidge junior valve lathe was designed for Ford valves, and other valves with valve heads of cast iron or of ordinary hardness. It is a compact, light machine and goes quickly and easily. It may be clamped

in a vise or held in one hand and operated with the other. It is so simple that a machinist is not required to operate it, and is used in a good many repair shops where work on Fords is done.



Readers who wish to obtain trade prices and fuller details can get them by writing to A. C. Savidge, Indianapolis, Ind., and mentioning the American Garage and Auto Dealer.

SE-MENT-OL NOW COMES IN LIQUID FORM.

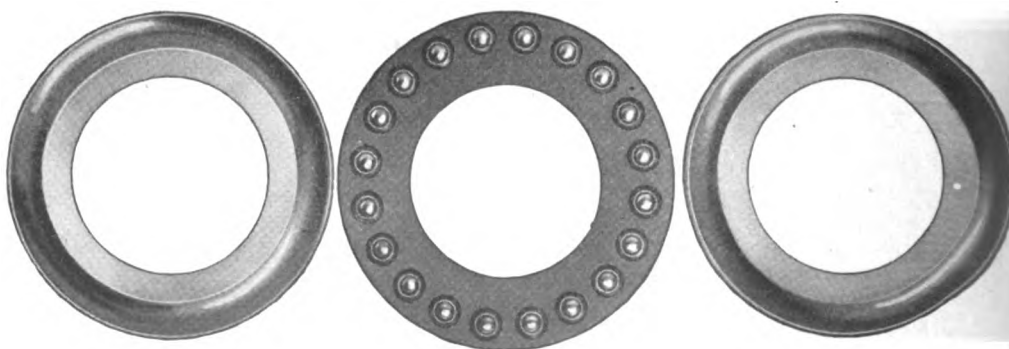
Se-Ment-Ol liquid, a product which will add to the convenience of the motorist, has been placed on the market by The Northwestern Chemical Co., Marietta, Ohio, makers of the Norwesco "chemically correct" automotive equipment. The liquid contains all the chemical properties of the original powder form, known as the radiator cement that "finds the leak and fixes it."

The motorist pours Se-Ment-Ol liquid into his radiator and drives on, as it is not necessary to lay up the car to allow the repair to set or harden. The water in circulating through the cooling system carries Se-Ment-Ol to the leak and on coming in contact with the air it congeals and is hardened by the heat from the motor forming an elastic repair which cannot be destroyed by the action of the water or the vibration of the car.

GRAHAM ROLLER BEARINGS CURE AXLE AND GEAR TROUBLE

Graham ball thrust roller bearings are declared to be a cure for axle and gear trouble in Ford cars which are caused by the thrust washers on the left of the differential wearing thin, allowing the gears to get out of proper mesh, causing undue pressure on differential case and axle, frequently resulting in broken parts.

It is claimed that Graham bearings save power and gasoline, reduce repair bills and rear axle noises, prevent broken gears and increase the life of the rear axle and add to hill-climbing ability. They are produced by the Graham Roller Bearing Co., at Coudersport, Pa.



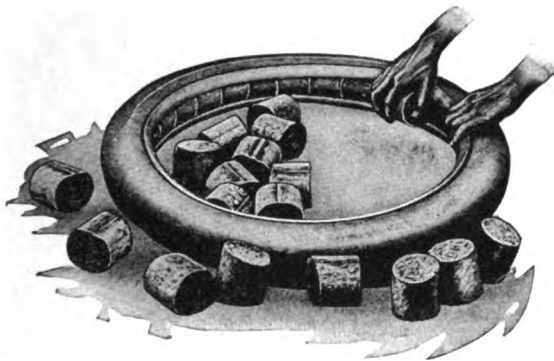
How You Can Conserve with National Rubber Tire Filler

More Miles Per Tire—Less Tires to Buy and No Buying of Tubes at All.

During the period of the War we learned to conserve in many ways—Food, Fuel, Farm-stuffs, Man-power and Transportation Facilities were first. The use of

National Rubber Tire Filler

offers you a medium for continuing to conserve without any sacrifice whatever.



Motorists Have No Tire Trouble Who Ride on This Perfect Substitute for Air

Rim-cut-proof, blowout-proof, puncture-proof tires are now a reality. Motoring is now freed from the shackles of tire trouble, and is made safe, comfortable and enjoyable.

National Rubber Tire Filler replaces the inner tube. It has all the resiliency of an air-filled tire with none of its disadvantages. It lasts indefinitely—40,000 miles or more. It has been in use for seven years and has conclusively proven its superiority and economy over air-filled tires. Our factory taxed to capacity is proof positive of its great popularity.

It rides as easy as air.
It cannot puncture or blowout.
It can be used on all style tires.
It doubles tire mileage.
It is easily installed.
It stimulates motoring.

National Rubber Filler Company
210 College Street Midlothian, Texas

Service

CAR owners will generally estimate the quality of your service by the quality of the product you sell.

Satisfaction to car owners—satisfaction and profit to dealers—that is the ultimate aim of Harvey Service.



THERE'S A HARVEY JOBBER NEAR YOU
Our new catalogue giving Complete measurements
of over 900 Styles of Springs is yours on request

**HARVEY SPRING
& FORGING CO.**

922-17th Street

RACINE, WIS.

Attractive Signs Lead Trade to Dealer's Door

Standardization of the various makes of automobiles and automobile accessories is forcing garage owners and accessory dealers into new lines in the matter of obtaining new business, both local and transient. Reports of analysts who have investigated conditions lead to the conclusion that attractive display on the part of the automotive dealer is one of the prime necessities of successful business.

Among the various devices which the garage man and accessory dealer has at his

command is the electric sign. Glance down the "automobile row" of any large city any night and be convinced that the electric sign is one of the most potent of garage and accessory advertising mediums.

An attractive, porcelain enameled sign, such as those of the Federal Sign System, furnish an attraction for new business. When a visiting motorist turns into a street it is the garage with the attractive sign to which he drives for tubes, repairs and service. The day when the garage keeper used his front window as a store-room and could get along without a sign, is past. Competition is too keen.

There is no medium which the accessory dealer has at his command which offers greater opportunities by which the local tradesmen can benefit by national advertising campaigns.

From standpoints of return, economy, both as to original cost and upkeep, and attractiveness, it is claimed that the electric sign is without a peer in the garage and accessory field.

Twenty-nine states out of the 48 have reported that they can use 11,637 soldiers and sailors as skilled laborers and 91,904 as unskilled in road work this year.

Calendar of Events

Feb. 15-22—Minneapolis, Minn.—Automotive Show, Exposition Building.

Feb. 15-22—Newark, N. J.—Show.

Feb. 15-22—Cleveland, O.—Show, Wignmore Coliseum.

Feb. 15-22—Albany, N. Y.—Show, State Armory.

Feb. 17-22—St. Louis, Mo.—Show.

Feb. 17-22—Des Moines, Iowa—Show.

Feb. 17-22—Grand Rapids, Mich.—Show.

Feb. 17-22—Louisville, Ky.—Show.

Feb. 17-22—South Bethlehem, Pa.—Car show.

Feb. 18-22—Wichita, Kan.—Tractor Show.

Feb. 18-22—Baltimore, Md.—Show, Fifth Reg't Armory.

Feb. 18-22—Oklahoma City, Okla.—Automotive Show.

Feb. 22-Mar. 1—Atlantic City, N. J.—Show.

Feb. 22-Mar. 1—Hartford, Conn.—Show.

Feb. 24-27—South Bethlehem—Truck Show.

Feb. 24-Mar. 1—Kansas City, Mo.—Show, Convention Hall.

Feb. 24-Mar. 1—Kansas City, Mo.—Tractor Show.

Feb. 24-Mar. 1—Burlington, Iowa—Show.

Feb. 24-Mar. 1—Portland, Ore.—Show.

Feb. 24-Mar. 1—Springfield, Mass.—Show.

Feb. 26-Mar. 1—Madison, Wis.—Automotive Show.

Feb. 26-Mar. 1—Mason City, Iowa—Show.

Mar. 1-8—Detroit, Mich.—Show.

Mar. 3-8—Muskegon, Mich.—Show.

Mar. 3-8—Scranton, Pa.—Show.

Mar. 3-8—Buffalo, N. Y.—Show.

Mar. 3-8—Bridgeport, Conn.—Show.

Mar. 5-8—Quincy, Ill.—Show.

Mar. 8-15—New Brunswick, N. J.—Show.

Mar. 10-15—Omaha, Neb.—Automotive Show.

Mar. 10-15—Syracuse, N. Y.—Show.

Mar. 10-15—Paterson, N. J.—Show.

Mar. 15-22—Boston, Mass.—Show.

Mar. 15-22—Harrisburg, Pa.—Show.

Mar. 17-22—Great Falls, Mont.—Show.

Mar. 17-22—Trenton, N. J.—Show.

Mar. 19-22—St. Joseph, Mo.—Show.

Mar. 22-29—Brooklyn, N. Y.—Car Show.

Mar. 22-29—Pittsburgh, Pa.—Show.

Mar. 26-29—Watertown, N. Y.—Show.

Apr. 1-5—Brooklyn, N. Y.—Truck Show.

Apr. 14-19—Bristol, Va.—Tenn.—Automotive Show.

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

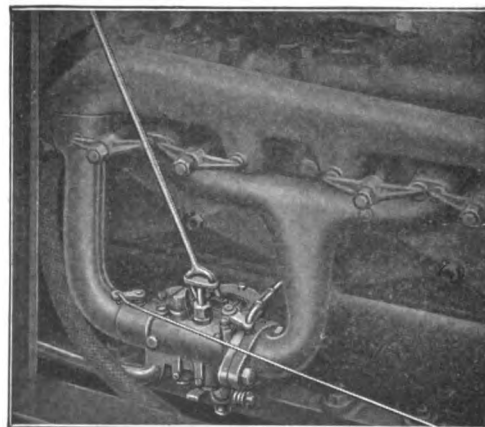
Retails for \$9.00 complete.

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

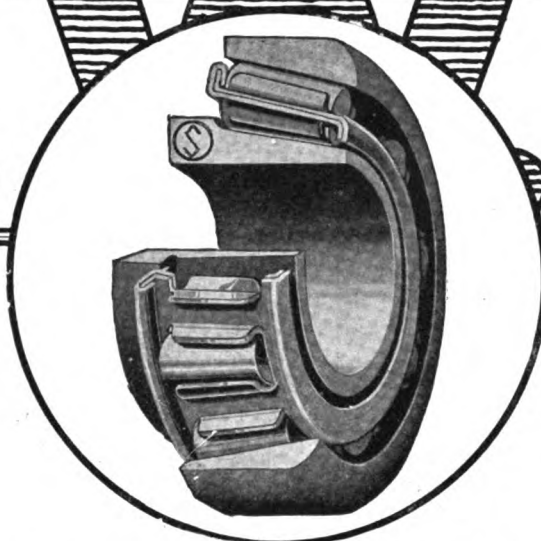
MODEL "E" Carbureters greatly improve Overland and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.



F. W. S. ROLLER BEARING



A mechanically perfect bearing with exclusive features of proven superiority.

The life of a roller bearing is the life of the cage.

The roller cage in the F. W. S. Roller Bearing is two ply, high carbon, pressed steel with three ply reinforcement.

Large open roller pockets and broad cage wings afford free movement of the rollers and thorough lubrication.

For FORD and CHEVROLET Front Wheels

Live dealers find easy sale and pleasing profits in handling these bearings.

Distributed through recognized jobbers only. If yours cannot supply you, write and we will see that your wants are met.



F. W. STEWART
1402 Michigan Avenue, CHICAGO



CYLINDER RE-BORING

A necessity when Engine Cylinders of Passenger Cars—Trucks—Tractors—Stationary Engines and Motorcycles—have become scored or worn

The demand today is greater than ever before in the world's history.



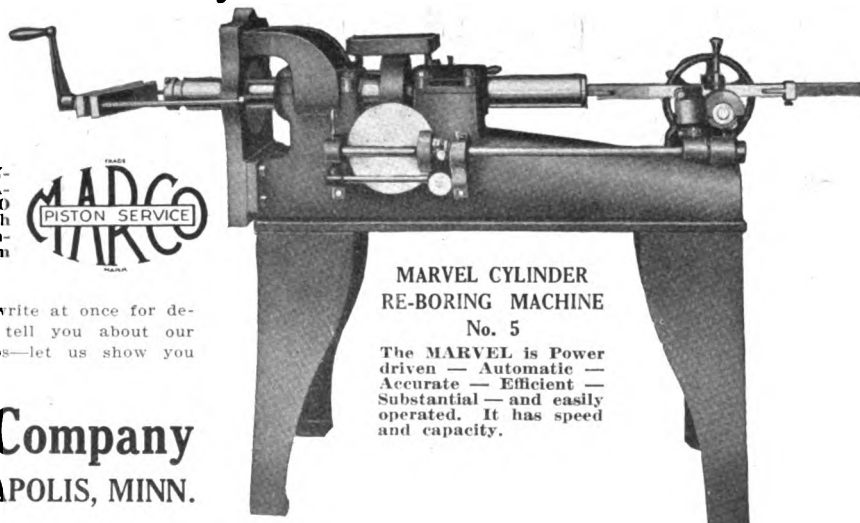
Install a MARVEL CYLINDER RE-BORING MACHINE No. 5 and MARCO PISTON SERVICE which enable you to re-bore Engine Cylinders and fit them with over-size Pistons.



If you are neglecting this profitable work—write at once for descriptive circulars of the MARVEL—let us tell you about our special Co-operative Advertising Dealer Helps—let us show you how we bring business to you.

Marvel Machinery Company

1307 So. Third Street MINNEAPOLIS, MINN.



MARVEL CYLINDER
RE-BORING MACHINE
No. 5

The MARVEL is Power driven — Automatic — Accurate — Efficient — Substantial — and easily operated. It has speed and capacity.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company

1002 Washington Boulevard
Chicago, Illinois



"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."

Approved by the Underwriters' Laboratories, and affords 15% discount on insurance.

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

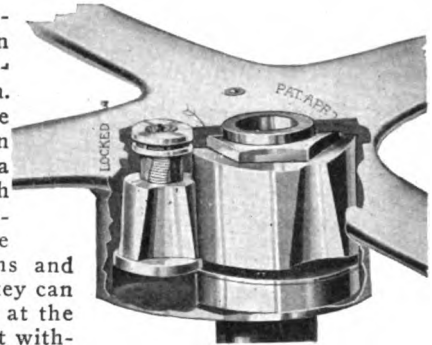
Write today for particulars.

THE RELIANCE COMPANY

411-417 So. Sangamon St.,

CHICAGO, ILL.

Distributors in every state



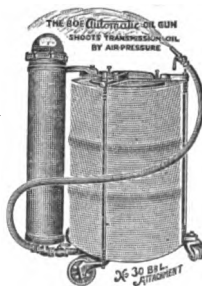
Why Not Make Any BARREL a Portable Self-Measuring TANK?



OUR BARREL ATTACHMENT

truck with steel reinforcing plates for barrel heads and air-pressure solved it.

Dispenses and accurately measures fluid or semi-fluid oil directly from original barrel into oiling system of autos, etc., simply by operator opening a shut-off valve.



ALSO MANUFACTURERS OF THE WELL KNOWN BOE AUTOMATIC (air pressure, self-measuring) GREASE GUN, 27 lb., 32 lb. and 100 lb. capacity.

Used by thousands of garagemen, also by Uncle Sam and by nearly all leading automobile manufacturers.

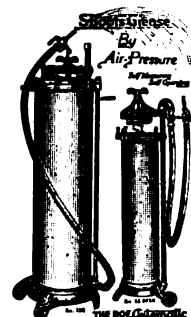
For sale by jobbers throughout the U. S. and in foreign countries.

Write us

H. M. BOE COMPANY

2416 University Ave. S. E.

MINNEAPOLIS MINNESOTA



Pondelick Brothers

will pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrinding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

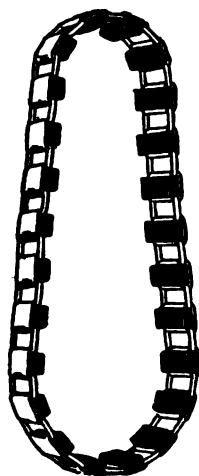
General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Send for details of our
sales co-operative policy

You will be much interested in our proposition as the profits we offer
are considerably larger than you can make on ordinary fan belts.



"CROWE" MECHANICAL FAN BELTS

For Automobiles, Trucks and Tractors

Are the most efficient belts as the steel and wire links produce strength and durability, while soie leather blocks provide noiseless friction. Neither are CROWE mechanical fan belts affected by heat, oil or water. Will not slip, stretch, or break.

PRICES
Standard Ford Sizes, adjustable to all models, each.....\$1.25
Flat Type, any length or width desired, per foot..... .60
V Type, any length or width desired, per foot..... 1.20

Guaranteed fan belts for automobiles, trucks, and tractors.

Write or wire us for details of our sales co-operation policy.

MECHANICAL BELT COMPANY,

2014 Frederick Avenue
ST. JOSEPH, MISSOURI

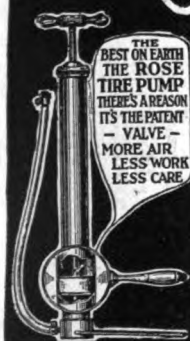
QUALITY

ROSE TIRE PUMPS

ROSE products satisfy
service pleases

SERVICE

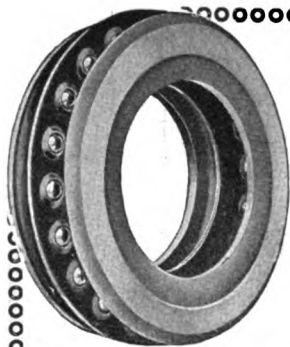
OVER 1,000,000 IN USE



J. H. Haney & Co
Hastings Neb
ASK YOUR JOBBER
MFGRS



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



GRAHAM Ball Thrust Bearings For FORD Cars

A Cure for Axle and Gear Troubles

which are caused by the thrust washers on the left of the differential wearing thin, allowing the gears to get out of proper mesh, causing undue pressure on differential case and axle, frequently resulting in broken parts.

The substantial Graham Ball Thrust Bearing eliminates these troubles. Here are 10 reasons for using it.

- | | |
|----------------------|---------------------------------|
| It is guaranteed | Prevents broken gears |
| Saves power | Reduces rear axle noise |
| Saves gasoline | Increases rear axle life |
| Does not wear thin | Keeps gears in proper mesh |
| Reduces repair bills | Increases hill climbing ability |

Dealers and Garagemen--Write for particulars, and trade prices

Graham Roller Bearing Company
COUDERSPORT - - - PENNA.

Nokorode

SOLDERING PASTE

is a "great" favorite in the automobile industry among leading passenger car and motor truck makers, besides garages and repair shops. Insures perfect soldering and thus is ideal for all motor work.

Don't be without it—you may want it for your next job.

Most economical to use.

Put up in handy metal containers. Postal card brings sample, price list and literature.

The M.W. Dunton Co.
PROVIDENCE R.I.
U. S. A.



MONOGRAM OILS & GREASES

Does your garage sell them? If not, you are not "cashing in" to the fullest extent on your oil and grease business.

Write today
for full
particulars.

NEW YORK LUBRICATING OIL COMPANY

NEW YORK - CHICAGO

Branches in
Principal cities



Indispensable, around the soldering shop—

Over 5000 mighty bright soldering men say they have learned a lot from

SOLDERING KINKS

ILLUSTRATED

If you need it send your quarter to

Telephony Pub. Co.
116 South Michigan Avenue, Chicago



**Its a happy
garageman
who has a
HOLMES
WRECKING
TRUCK**

This advertisement actually expresses the attitude of hundreds of garagemen and repairmen who have a **HOLMES WRECKING TRUCK**.

Regardless of the wrecked condition of the car, it can be readily "towed in" with a **HOLMES**.

Staunchly built, frame and wheels of malleable iron castings, Hyatt roller bearing for wheels and tongue of second growth ash.

PRICE, \$50.00
Special Discounts to Garages and Dealers.

ROBERT HOLMES & BROS.
DANVILLE, ILLINOIS



Busy places like this garage need a

CALCULAGRAPH

so that the "proper charges" for time work will be made

A Calculagraph records *Elapsed Time* and prevents complaints with customers over repair charges.

5c
CALCULAGRAPH COMPANY
DEPT. 77
30 CHURCH ST.
NEW YORK CITY



Send for Calculagraph Booklet



Smooth as the flight
of the birds



going South for the Winter is the progress of the Ford equipped with

**W. & C.
Shock Absorbers**

The 200,000 Fords equipped with these Shock Absorbers is adequate proof of their superiority. There are thousands sold every month.

DEALERS: Every Ford owner is a likely prospect for W. & C. Shock Absorbers. The expenditure of \$10.00 adds many times that amount to the life of the car, to say nothing of the comfort afforded.

The margin of profit to you is unusually liberal.

Write today for our dealer offer.

P. H. WEBBER CO.
Hoopestown, Ill.



AMPECO PRODUCTS

Sell readily because their superiority is well known to the Motoring Public

AMPECO PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. AMPECO Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes. We also make the famous AMPECO WHEEL PULLERS and BRAKE SHOES, both one- and two-piece. If your jobber does not handle AMPECO Products, write us direct.

F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

General Selling Agent for

**American
Machine
Products
Co.**

Marshalltown,
Iowa





Old Spark Plugs Fire Like New Ones

when equipped with

UNIVERSAL OR MARVEL SPARK PLUG INTENSIFIERS

There is a big demand for a device that insures satisfactory operation from spark plugs which are worn out or on which the insulation is broken, or a plug fouled with grease or carbon.

These INTENSIFIERS will make such plugs fire perfectly. They indicate instantly whether a cylinder is misfiring and whether the ignition system is in perfect order. They give the spark more energy—producing more power and a smooth running motor. They eliminate carbon, waste of gas, cleaning the plugs and guessing which cylinder is misfiring.

EVERY ONE OF YOUR CUSTOMERS WILL WANT THEM

JOBBER and DEALERS—Your profit is liberal.

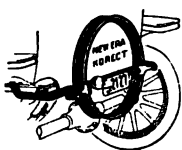
Write today for our attractive proposition.

UNIVERSAL MFG. & SALES CO.

552 W. Harrison Street

CHICAGO, ILL.

"Sly" Interchangeable Rear Tire Carriers



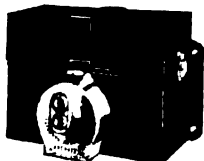
for Ford and Chevrolet "490" tires, holds either casing alone or casing on demountable rim; has expansion grip inside of rim; avoids all contact or chafing; accommodates lamp and number plate. Has provisions for locking through holes in adjusting turnbuckle. A big seller every dealer should stock.

If your jobber does not list this tire carrier, write us for complete catalog of tire carriers, "Better" Springs, and "Better" Bumpers.

NEW ERA SPRING & SPECIALTY COMPANY

1152 Hamilton Ave.,

Grand Rapids, Michigan



Sells for \$4.00
Worth the price of car

The DEFENDER is the "Standard" Ford Ignition Lock

Always demand the Defender, and take no imitations. The Defender safely locks the coil-box, and is the only lock that grounds the electrical system; this makes them thief-proof. Insurance Companies require the Defender and allow 15% off on Insurance.

DEFENDER AUTO LOCK CO.

DETROIT, MICHIGAN

Dealers! Garagemen!

Put in a complete, assorted stock of
VULCAN SPRINGS

Link up Spring Service for Your Customers with Vulcan "Spring Service for the Nation." Write now for our special proposition of assorted stock of quick sellers, with Display Rack, Doorsign, Window Transfers, etc.—Free.

Jenkins Vulcan Spring Co.

Richmond, Indiana

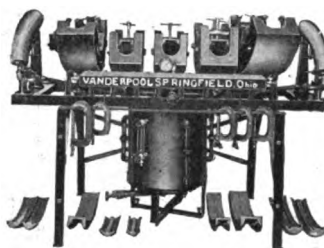
Stock Carried at These Branches:

St. Louis Mo., 1402 Chestnut St.
Minneapolis, Minn., 1024 Hennepin Ave.
Dallas, Texas, 209 So. Houston St.
Reading, Pa., 538 Franklin St.
Sumter, S. C., 29 Caldwell St.
Atlanta, Ga., 48 Auburn Avenue



This Year—An Overwhelming Prosperity for Tire Repairers

Automobile Manufacturers now back to normal capacity. The thousands of back orders being filled, means many more thousands of tires to be repaired.



We supply complete outfit. We send you **FREE TIRE REPAIRING MANUAL**—explains entire workings of the business. Vanderpool Vulcanizer used by veteran tire repair men in preference to all others. Write for particulars.

In answering address
Dept. F6

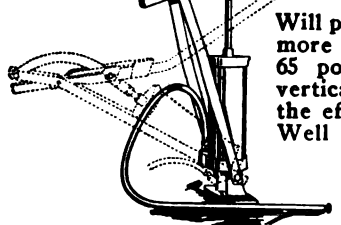
The Wm. Vanderpool Co., Springfield, O.

Tell your customers
not to break their
backs pumping tires.

\$5.50

Jensen

Tire Pump



Will produce 90 pounds pressure more easily than you can pump 65 pounds with the ordinary vertical pump, with one-quarter the effort and in half the time. Well made throughout.

Discounts, on request

The W. H. Howell Company

10 State St.,

Geneva, Illinois

NOTICE

Adopting a strictly cash basis, decreasing production costs and increasing production permits us to decrease the retail prices of our testing instruments and publications.

Prices reduced from 30% to 60%

Write today for full information.

Auto Electric Systems Publishing Co.

and

Phillips Engineering Company

DAYTON, OHIO

BERMO

\$25 to \$300

To do welding economically and profitably, you must have the proper equipment. **BERMO WELDING PLANTS** are made in a number of styles, embracing every purpose. Every garage and repair shop should have one.

Write for particulars and our time payment plan.

A. J. BERMO CO.
OMAHA, NEB.

**3 to 6 months
to pay**

WELDING PLANTS

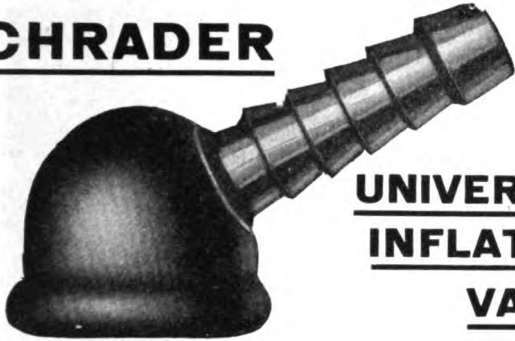
Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

No wasted "Free Air"

SNAP! When the inflating valve is removed the **AIR PRESSURE STOPS**

All garages and repair shops distributing free air can profitably use the

SCHRADER



**UNIVERSAL
INFLATING
VALVE**

If you have a SCHRADER valve you know that your "bottled air" is safely tucked away the minute it is taken off the tire valve. The air is released by pressing the nozzle of the inflating valve against the tire valve, and stopped by removing the device from the tire valve. Fits any diameter of hose from $\frac{1}{4}$ to $\frac{5}{8}$ inch. Price, \$1.50.

A. SCHRADER'S SON, Inc.
783-793 Atlantic Ave., Brooklyn, N. Y.

YOU CAN MAKE BIG PROFITS Charging Auto Storage Batteries

In the winter months, heavy starter service when the engine is cold and excessive use of lights on account of shorter days, quickly drain the automobile storage battery and bring big profits in battery charging. The very thing that makes business run low in other lines makes battery charging run highest. Hundreds of owners of HB Charging Equipment are clearing

\$150 to \$200 a Month Extra Profit

Some even more. What you can make depends entirely upon yourself. If you go into this business right and push it hard so as to need large capacity to charge the batteries that will be brought to you, we recommend this new 32 Battery Capacity Charger. It contains an amply designed 5 H.P. Motor, operating from city current and developing 2 K.W. Generator capacity. It will charge 32 6-volt batteries or their equivalent at one time. Four separate charging lines and panels permit individual attention to every battery. It is a real money maker, which, with convenient terms of payment offered

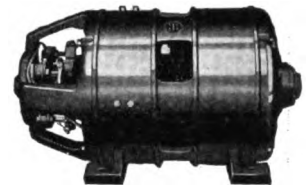
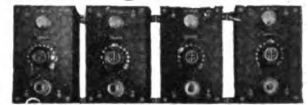
**with this
32 Battery
Capacity
Charger**

Will Easily Pay for Itself

while you use it. Under absolute money-back guarantee, you run no risk. Write at once for further information, prices and terms. Start this money-making business now.

We can furnish smaller outfits, either for use on city current or with belt drive. Write for further information.

Hobart Bros. Co.
Box G2 TROY, OHIO



**Keep them where
you can find them!**

Our revolving cases will prove to be the handiest for you in locating your repair parts, such as bolts, screws, cotter pins, ball bearings, etc.

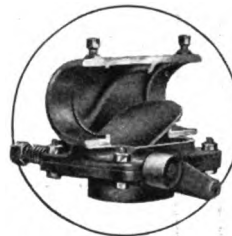
These cabinets also prevent rust and loss.

Descriptive catalogue on request.

American Bolt & Screw Case Co.
DAYTON - OHIO

Revolving Cases for garage and service stations

**"Tells the
motor's
secrets"**



For complete information about the G-P MUFFLER CUT-OUT write to Sales Department EDWARD A. CASSIDY CO., Inc., Madison Avenue at 40th Street, New York City

Manufacturers:
The G. Piel Co., Inc., Long Island City, N. Y.

**Put your repair charges on a
profitable basis with**

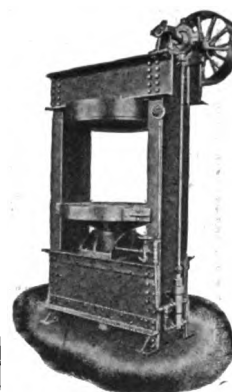


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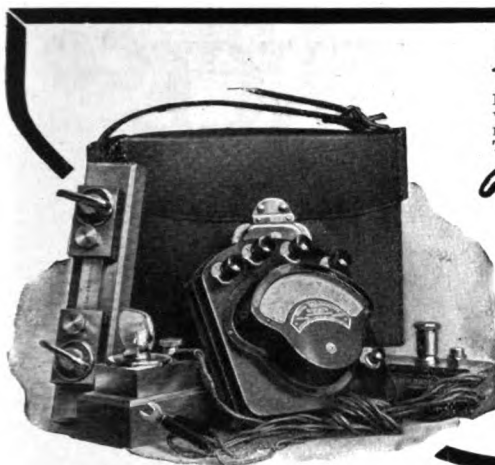
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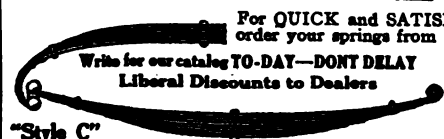
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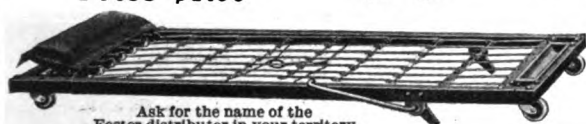
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Zinke Co., The, 1323 So. Michigan Ave., Chicago.

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E. A. Cassidy Co., 285 Madison Ave., New York City. (Sales Dept. for Eccolene Co., Detroit, Mich.)
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American Machine Products Co., Marshalltown, Iowa.

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Butler Mfg. Co., Indianapolis, Ind.
Ever-Tight Piston Ring Co., 1609 Kingsland Ave., St. Louis.
Gill Mfg. Co., 357 W. 59th St., Chicago.
Inland Machine Works, 817 Mount St., St. Louis.
No Leak-O Piston Ring Co., Baltimore, Md.
Pondelick Bros., Leavitt St. and Jackson Blvd., Chicago.
Prynn Ball Bearing Works, 1919 Michigan Ave., Chicago.

PUMPS

The W. H. Howell Co., 10 State St., Geneva, Ill. (Jensen Tire Pump.)
J. H. Haney & Co., Hastings, Neb.

RADIATORS

Detroit Auto Radiator Co., 180 Fifth St., Milwaukee, Wis.
Hooven Radiator Co., 519 Monroe St., Chicago.

REPLACEMENT COILS AND RESISTANCE UNITS

New York Coil Co., 338 Pearl St., New York City.

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W. S. Burgess Mfg. Co., 1323 S. Michigan Ave., Chicago.
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Commonwealth Edison Co., 72 W. Adams St., Chicago, Ill. (Federal Electric Signs.)
Federal Sign System, Lake & Desplaines Sta., Chicago.
Flexlume Sign Co., Niagara St., Buffalo, N. Y.

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Chicago Solder Co., 218 No. Union Ave., Chicago, Ill.

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M. W. Duntun Company, Providence, R. I.

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Auto Spring Repair Co., 1331 Jackson Blvd., Chicago.
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Bermo Supply Co., Omaha, Neb.
St. Paul Welding & Mfg. Co., 173 W. 3rd St., St. Paul, Minn.

WRECKING TRUCKS

Robt. Holmes & Bro., Danville, Ill.

WRENCHES

The Graham Roller Bearing Co., Coudersport, Pa.

Index to Advertisements

| A | | J | |
|----------------------------------|--------|-------------------------------------|----|
| Adams & Elting | — | Jenkins Vulcan Spring Co.... | 48 |
| Advance Automobile Accessor- | 3 | Jorgensen Mfg. Co..... | — |
| ries Corp. | 51 | | |
| American Accessories Co..... | 49 | | |
| American Bolt & Screw Case | 47 | | |
| Co. | 49 | | |
| American Machine Products Co. | — | | |
| American Oil Pump & Tank | — | | |
| Co., The | — | | |
| American Technical Society... | — | | |
| Aske Automatic Voltage Regu- | — | | |
| lator Co. | 8 | | |
| Atlas Auto Supply Co..... | 50 | | |
| Auto Cape Top Co..... | 50 | | |
| Auto Engine Works..... | 50 | | |
| Auto Parts Co..... | 50 | | |
| Auto Spring Repair Co..... | 51 | | |
| Auto Wrecking Co..... | 50 | | |
| B | | K | |
| Baird Equipment Co..... | 49 | Kennedy Car Liner & Bag Co.. | 51 |
| Bermo Co., A. J..... | 48 | Kimball Tire & Rubber Co.... | — |
| B. & M. Mfg. Co..... | — | | |
| Boe Co., H. M..... | 44 | | |
| Brunner Mfg. Co..... | 29 | | |
| Buettner Co., Chas. H..... | 51 | | |
| Butler Mfg. Co..... | 50 | | |
| Bufum Tool Co..... | 51 | | |
| Burgess Mfg. Co., W. S..... | 25 | | |
| C | | L | |
| Calculagraph Co..... | 47 | Lawrence & Co., L..... | 51 |
| Cassidy Co., Edward A..... | 49 | Lourie Mfg. Co. | 49 |
| Catelain, Andre G..... | 50 | | |
| Chicago Baling Press Co..... | 51 | | |
| Chicago Solder Co..... | 21 | | |
| Commonwealth Edison Co. | 39 | | |
| Curtis Pneumatic Machinery Co. | 21 | | |
| D | | M | |
| Dearborn Truck Co..... | — | McDaniel Rubber Co., Leo..... | — |
| Defender Auto Lock Co..... | 48 | Malbohm Wagon Co..... | — |
| Denby Motor Truck Co..... | 7 | Marmon Chicago Co..... | — |
| Detroit Auto Radiator Co..... | 50 | Marvel Carburetor Co..... | 42 |
| Dunton Co., M. W..... | 46 | Marvel Machinery Co..... | 43 |
| E | | Mechanical Belt Co..... | 45 |
| Eccolene Company | — | Miami Trailer Co..... | 4 |
| Elgin Motor Car Corp..... | — | | |
| Ever-Tight Piston Ring Co..... | 4 | | |
| F | | N | |
| Federal Sign System (Electric) | 39 | National Cash Register Co.... | 31 |
| Flexlume Sign Co.....Back Cover | — | National Rubber Filler Co.... | 41 |
| Forbes, J. P..... | — | National Wire Wheel Works.. | 5 |
| Foster Bros. Mfg. Co..... | 51 | New Era Spring and Specialty | — |
| Franklin Mfg. Co..... | — | Co. | 48 |
| G | | New York Coil Co..... | 53 |
| Ganschow Co., William..... | 44 | New York Lubricating Oil Co.. | 46 |
| Garden City Spring Works..... | 53 | No-Leak-O Piston Ring Co.... | 51 |
| Gill Mfg. Co..... | 54 | Norma Company of America, | 6 |
| Globe Mfg. Co..... | 54 | The | 6 |
| Graham Roller Bearing Co., | — | | |
| The | 46 | | |
| Greer College of Motoring..... | 50 | | |
| H | | P | |
| Haney & Co., J. H..... | 45 | Paro, H. G., Co., Inside Back Cover | — |
| Harton & Co., Inc., Thos. J.... | — | Phillips Engineering Co..... | 48 |
| Harvey Spring & Forging Co. | 41 | Pondelick Bros. | 44 |
| Hobart Bros. | 49, 53 | Pruyn Ball Bearing Works.... | — |
| Holmes & Bros., Inc., Robert.. | 47 | | |
| Hooven Radiator Co..... | — | | |
| Howell Co., The W. H..... | 48 | | |
| I | | R | |
| Inland Machine Works..... | — | Reliance Co. | 44 |
|Inside Front Cover | — | Romort Mfg. Co..... | 33 |
| Z | | | |
| Zinke Co. | 33 | | |

AUTOMOBILE SPRINGS
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago

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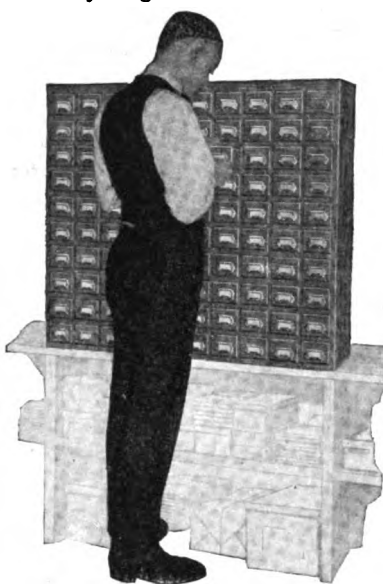
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HB UNIVERSAL SCREW CABINET

(100 COMPARTMENTS)

The Garage Man's one best bet for storing small, valuable repair parts, tools and accessories. Serviceable, economical, attractive and prevents loss and waste. Gives room for everything.



HB Universal Screw Cabinets

will hold screws, ball bearings, brushes, battery connections, bushings, couplings, cotter pins, nuts, nails, bolts, tools, switches, spark plugs, fuses, rivets, supplies, accessories, etc.

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HB Cabinets are sold direct to garage men under our absolute money-back guarantee. You run no risk in ordering from this advertisement.

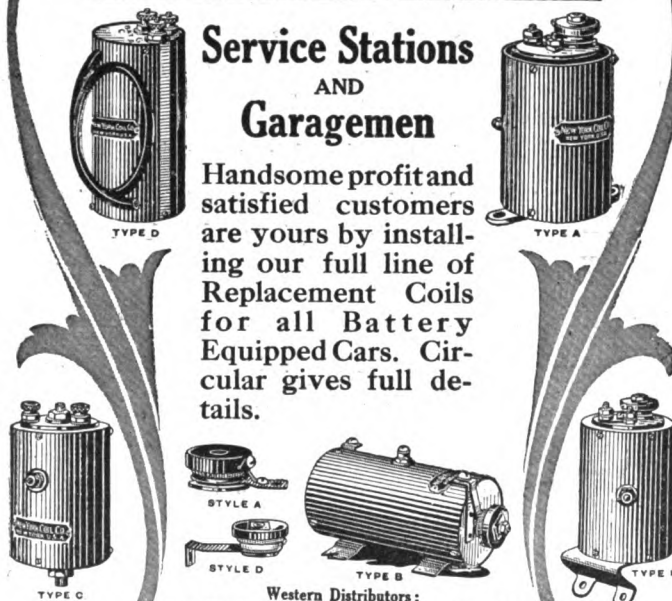
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HOBART BROTHERS CO., Box G2, TROY, OHIO

NEW YORK REPLACEMENT COILS AND RESISTANCE UNITS

Service Stations AND Garagemen

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NEW YORK COIL COMPANY
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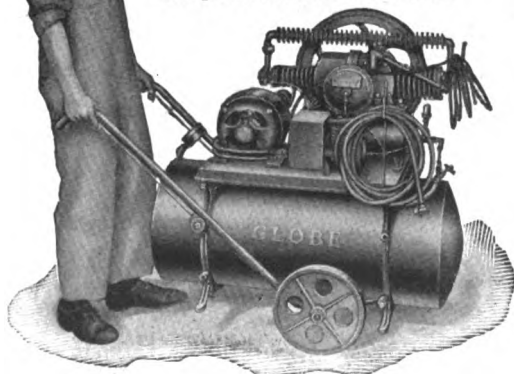
Place that Order for a **GLOBE** **AIR** **COMPRESSOR** **NOW!**

You can thoroughly comb the entire market, but nowhere will you find an air compressor which will give you more satisfaction than a GLOBE. (And the reason for this is simply that the GLOBE is the embodiment of the best and latest features.)

They give long service, supply clean air, free of oil.

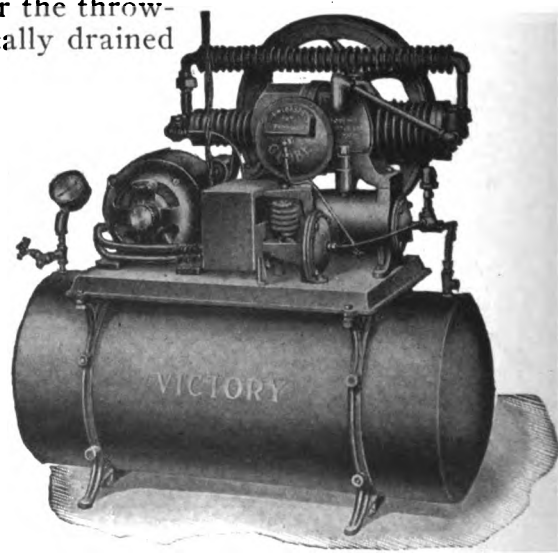
Neither can there be burning out of motors or the throwing or burning of belts; oil trap is automatically drained every time the compressor is stopped.

VICTORY-PORTABLE
Complete Motor Drive Unit



Write us at once and let us explain what type of air compressor will serve you best.

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MANUFACTURING
COMPANY
Battle Creek,
Michigan

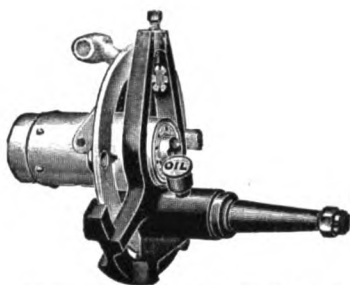


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Paul Specialties for the GARAGE!



Ekern Portable Garage Grease Gun, Model K



Ekern Emergency Axle Stub No. 3

Ekern's Emergency Axles—Nos. 1, 2 and 3

In case of a broken axle a car can be put on its own wheels in a few minutes' time and then towed in with ease.

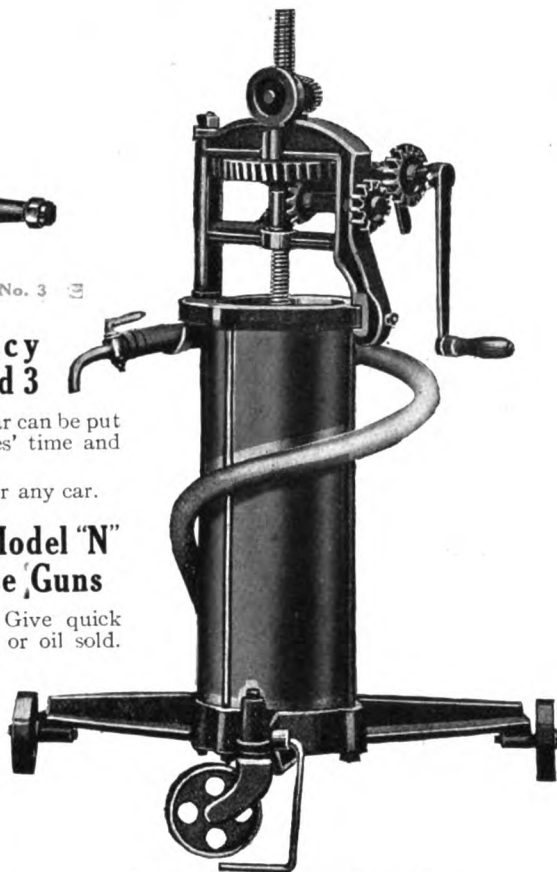
Nos. 1 and 3 for Fords, No. 2 for any car.

Ekern's Model "K" and Model "N" Portable Garage Grease Guns

These guns are practical, clean. Give quick service. Register amounts grease or oil sold.

Model K holds 20 lbs. grease or 2½ gal. oil.

Model N holds 56 lbs. grease or 7 gal. oil.



Ekern Portable Garage Grease Gun, Model N

Ekern's Portable Work Bench Also Ekern's Motor Stand

are both handy for Ford motor work and when equipped with the Ekern axle attachment are likewise useful for axle work. The motor can be taken from their car, put on the stand or bench and then rolled to any part of the shop where it can be held in any desired position. Are mounted on rollers. Work Bench has a loose roller that enables it to be dropped on its legs to give it a firm foundation.

If you wanted to climb to the 20th story you would use the elevator, not the old staircase. Then use our up-to-date devices to do your repair work and save your energy and profits proportionately. *Write your Jobber today for prices and information or address us for new booklet.*



Ekern Motor Stand for Ford Motors

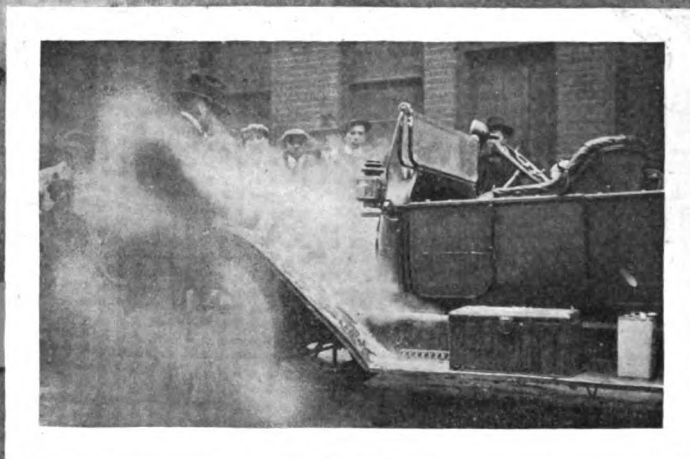
H.G. Paul & Co.

1412-14 South Michigan Boulevard
CHICAGO, ILL.



Ekern Portable Work Bench

FIRE-CHOKE
THE CHEMICAL
FIRE CHIEFS RECOMMEND



Just Throw It From Your Hand

**Get a Test Package of Fire-Choke
Free. Try It Yourself—That's All!**

If you will return this coupon properly filled out we will send you free a test package of Fire-Choke.

That is the best way to prove what it will do—try it yourself

If you use it according to the directions you will be convinced that it is the best fire annihilator to have on your car.

Fire-Choke is a dry chemical which forms great quantities of gas when exposed to fire, smothering the blaze. Fire chiefs say it is best, because it will put out more fires, because it is easiest to use, because the gas will not cause trouble, and the chemical itself will not harm the materials it comes in contact with.

Dealers Wanted

Send in this coupon now and get a test package of Fire-Choke, and if you are interested, full particulars concerning our special offer to dealers.

Retail Price, \$3.50 and \$5.00

THE FLEXLUME SIGN CO.

(Sole Distributors)

1336-1338 Niagara Street, Buffalo, N.Y.

Flexlume
Sign Co.
Buffalo, N.Y.
Please send me
without charge a test
package of Fire-Choke.

Name

Street

City

Nearest Dealer

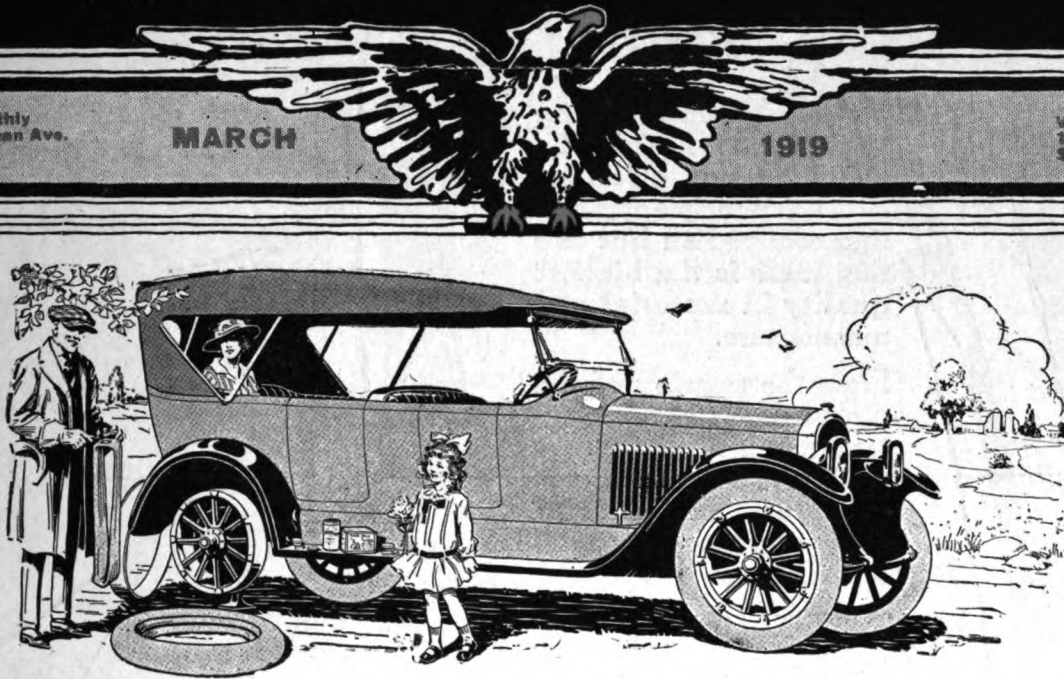
AMERICAN GARAGE & AUTO DEALER

Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

MARCH

1919

Vol. 19 — No. 3
10 Cents the Copy
\$1.00 Per Year



Saves Tubes—Saves Repair Bills

You can repair your own tubes—as good as new. It's easy and inexpensive. *The Shaler works automatically*—and without fail. Just touch a match to the non-flaming chemical fuel. In five minutes you have a firm, flat, "feather-edge," permanent repair—stronger than any "stuck on patch"—stronger than the tube itself. No gasoline, cement or flame, and no danger of injuring the tube. Carry it in your tool box for emergency use. It works in the wind, in any weather, anywhere. The heat is applied directly to the pure gum patch and does not extend to the tube itself.

Complete With 12 Patch and Heat Units \$1.50

The outfit includes the Vulcanizer—12 Patch and Heat Units (6 round for punctures and 6 oblong for cuts)—complete, \$1.50. Extra Patch and Heat Units 75c per dozen. Prices slightly higher west of the Rocky Mountains and in Canada.

Sold by All Accessory Dealers and Jobbers

TO DEALERS—To insure shipments—it is advisable to order from your jobber now. The great demand has exceeded our factory capacity and shipments will be made according to priority in receipt of orders.

Catalog of the Complete Shaler Line of Vulcanizers for Motorists, Repair Shops and Garages mailed on request.

C. A. SHALER, 352 Fourth St., Waupun, Wis.
Oldest and Largest Manufacturers of Vulcanizers



Mends Tubes in 5 Minutes

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Made right!

The Inland Spiral cut is not only the most efficient principle of piston ring construction but the ring itself is the highest quality in material and manufacture.

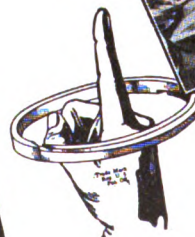
From the pouring of the mold to the last micrometer test, it is made with the precision of the finest machine tool. The pictures show eight of the main operations.

1. Molding the core.
2. Cutting the Spiral.
3. Cutting the ends.
4. Making width accurate.
5. First heat treatment.
6. Making circumference accurate.
7. Testing for circumference.
8. Testing for width.

New photo book free

It describes the making of the Inland from first to last. It will show you plainly why the Inland is now recognized the world over as the mechanically perfect piston ring—why Inland sales have grown to a millions per annum basis.

Inland
Machine Works,
1645 Locust Street,
St. Louis, Mo.
Jobbers everywhere
stock Inlands.



INLAND

Look Over The Ford Cars Layed Up For Repairs

REPAIR SHOP



Why are they laid up? Most frequently it's *rear end trouble*. What causes it? Transmission linings that grab and slip—producing heavy vibration and terrific strain on the rear axle.

Cork Insert Transmission Linings *save the Ford rear end*. They work with velvety smoothness. Eliminate the grab and slip—the vibration and the strain. They prolong greatly the life of the car and avoid repair bills. Next time your Ford needs new linings, remember to say

CORK INSERT TRANSMISSION LINING FOR FORDS

Over 500,000 Ford owners have found new pleasure and economy in driving their Fords, because of Cork Insert. It gives smooth stopping and starting, and a sure brake that you can get nowhere else.

Easy to tell the Genuine by the Red & Black Package

Dealers! Your Trade May Go ELSEWHERE If You Don't Give Them Cork Insert

Cork Insert fills a need that no other lining fills. It gives better service. That spells *satisfaction*. Cork Insert users are boosters. Your trade are hearing of them every day. They *want* Cork Insert. Pushing Cork Insert will bring you *new* trade. You can get Cork Insert in a few hours—*every* jobber handles it.

Advance Automobile Accessories Corp.
Dept. C-7, 56 E. Randolph St., Chicago



\$3.00
per set of 3
Rockies West \$3.25
Canadian Price \$4.50

Cork Insert Fan Belts for Fords

don't have to run tight to prevent slipping, like ordinary belts. The corks insure no-slip efficiency. This, plus its durable construction, means extra long wear and economy.



\$1
for 1917-18 Fords
85c for 1916 and Earlier Fords
Canadian Prices: 1917-18 Models \$1.50
Earlier Models \$1.25

PARO SPECIALTIES

increase GARAGE PROFITS

EKERN'S Model "K" and Model "N" Portable Garage Grease Guns are portable, practical and clean. Register shows amount of grease or oil sold.

Model K holds 20 lbs. grease or 2½ gals. oil.

Model N holds 56 lbs. grease or 7 gals. oil.

Our other money making, time saving devices for garages include: EKERN'S emergency axles Nos. 1, 2 and 3; EKERN'S portable work bench, also motor stand, etc. Our new booklet explains and illustrates *entire* line.

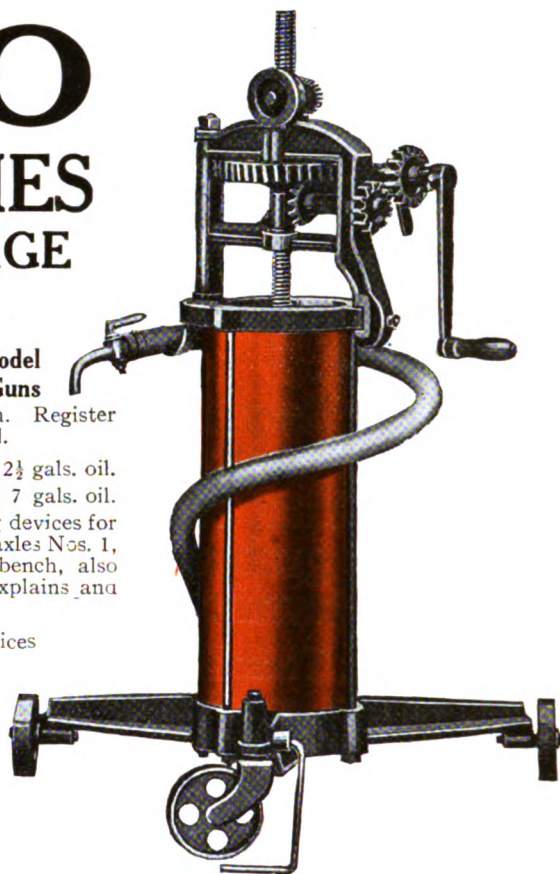
Write your jobber today for prices and particulars.

H. G. Paro Co.

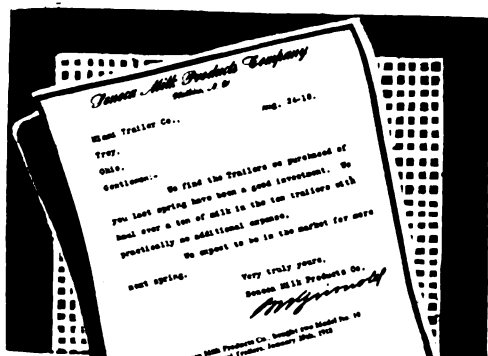
1412-14 South Michigan Blvd.
CHICAGO, ILL.



Ekern Portable Garage Grease Gun.
Model K

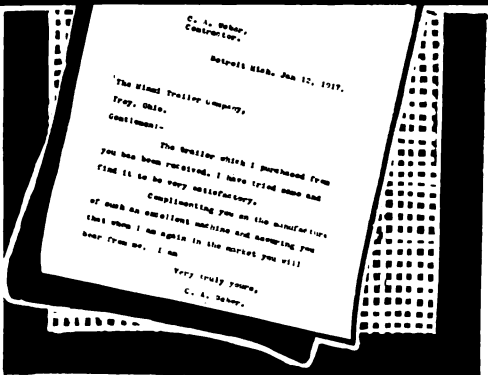


Ekern Portable Garage Grease Gun. Model N



MIAMI TRAILERS

"Stay Sold"



We want you to sell Miami Trailers

The Trailer idea is here to stay. Talk to any man who uses one—he will quickly convince you of that fact.

Five years from now, trailers will be as thick on city streets and country roads as trucks are today.

But think this over. The first automobile to go over in a big way, was the small car—the first big truck success from a selling standpoint was the light truck.

Right now—there are five prospects for small trailers to every one for the heavy ones. Every owner of a light truck—every one who operates a passenger car

for business purposes—is a **light trailer** prospect.

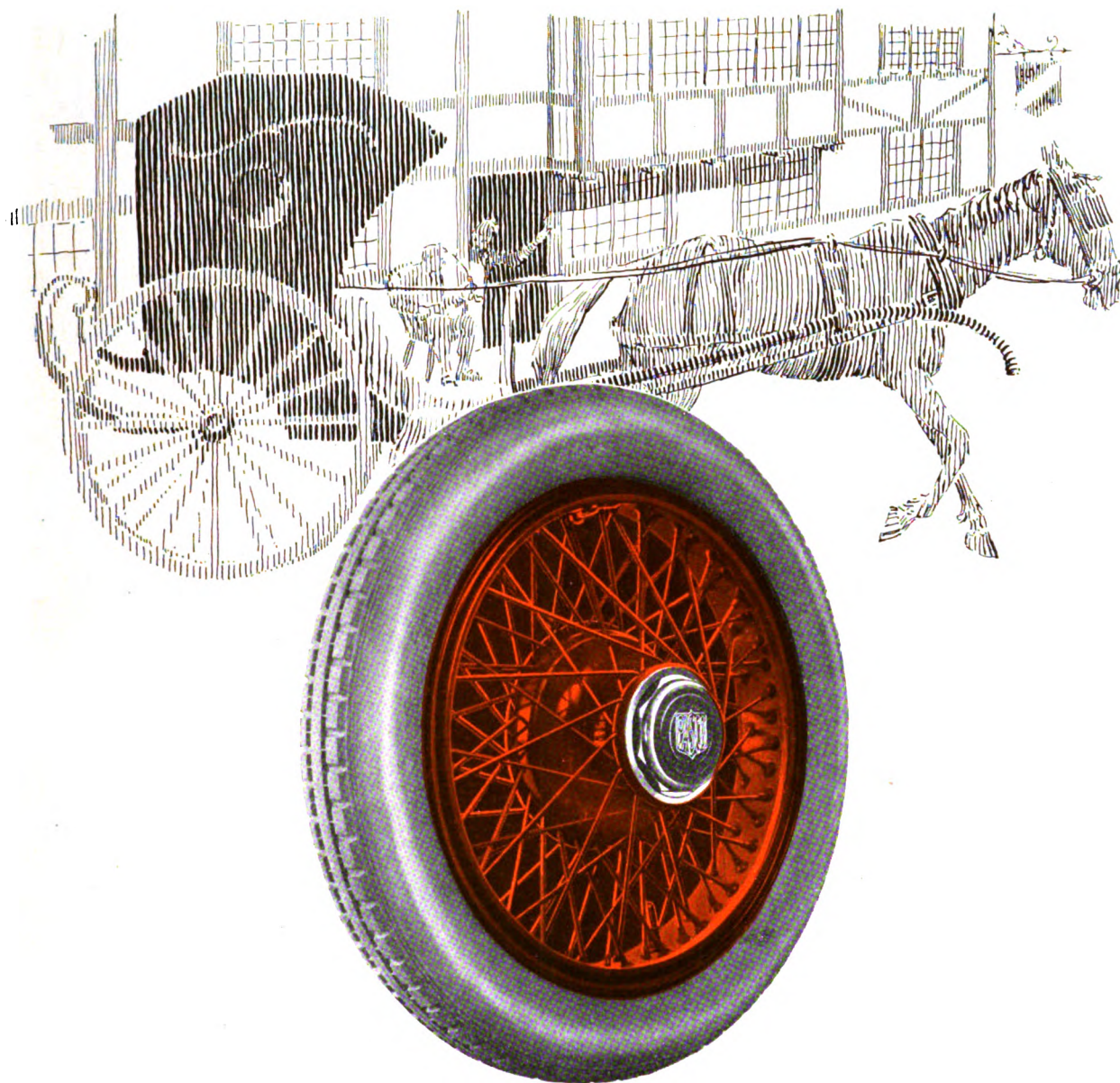
Light trailers sell fast.

They sell fast because they cost little—because their field for use is tremendous—because once in operation they advertise themselves.

Light trailers require no service. Once sold they are a constant asset—not a debit, to your business.

For every line of business there is an especially designed Miami Trailer. Write to us if you are interested.

MIAMI TRAILER CO. TROY OHIO



There's as much difference

between PASCO Wheels and ordinary wood wheels, as between a 1920 chummy roadster and the *One Hoss Shay*.

Staunch and impressive in appearance, the PASCO wheel represents the utmost in wire wheel manufacture. A *spoke-lacing* that gives complete curb-clearance—a *sure lock* that holds the wheel firmly on the hub—an *indestructible hub-cap*—the *standard width* of tread—the remarkable process of *rust-proofing* the entire wheel—these are but a few of PASCO'S advantages. A PASCO-equipped car will save its owner gasoline and tires, and greatly reduce wear-and-tear bills.

If you want to know about GOOD wire wheels send for literature.

DEALERS: There is profit for you in PASCO'S.

NATIONAL WIRE WHEEL WORKS, Inc.

Dept. G, GENEVA, N. Y.

Service stations in all principal centers.



"NORMA" PRECISION BALL BEARINGS

(PATENTED)

Day-in-and-day-out dependability never counted for so much—never was worth so much—never was so sought after—as now. To be ready at all times with the full measure of service—to be capable, if need be, of the super-effort that emergency may demand—can any small price-difference be considered for a moment, beside this?

"NORMA" Precision Bearings, in the high-grade ignition apparatus and lighting generators that are rendering maximum service today, are potent factors in the consistent performance which makes these accessories to be preferred where dependability is sought.

Be Sure—See That Your
Electrical Apparatus
is "NORMA" Equipped.

THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings.



AMERICAN GARAGE & AUTO DEALER

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|------------------------------|-------|
| Heavy Duty Roads Needed..... | 18 |
| Buy Now | 18 |
| Stimulating Business | 18-19 |

GENERAL

| | |
|---|-------------|
| Spring Will Soon Be Here!..... | 9 |
| Buy It Now | 10 |
| Trucks Not a Temporary Lino, but Permanent Profit Source | 11 |
| Advice on Buying a Truck | 11 |
| Rural Motor Express Solves "Short Haul" Transport Problem | 12-13-15 |
| Heavy Duty Roads Needed for Commercial and Martial Uses | 14 |
| Jobbers, Acquitted, Adopt New Declaration of Association's Purposes | 15 |
| Spring Will Soon Be Here | 16 |
| New Tax Rules in Force on Cars, Trucks and Accessories | 16 |
| ACCE\$ORIES, by M. E. FABER | 17 |
| New Spee-Dee Counter Display | 17 |
| Bigger Output Planned for Vulcan Spring Plant..... | 17 |
| Don't "Carry" Accessories, but Merchandise Them for Profit | 19 |
| Caywood Is Real Veteran of Air Compressor Field... .. | 19 |
| Selling and Advertising Firm Formed in Chicago... .. | 19 |
| Plan of Machinery Arrangement in Repair Shop for Garage | 20-21 |
| Victory Highways Advocated as Memorials to Vallant Troops | 21 |
| Evolution of Transportation | 22-23-24-25 |
| U. S. Bureau of Markets Wants Rural Motor Lines... .. | 26 |
| Firms All Over the World Use Lourie Tire Applying Presses | 28 |
| Make Windows Earn Dividends | 30 |
| Trailer Men Reorganize, Plan Aggressive Campaign | 32 |
| Highway Coal Delivery Plan of Fuel Official..... | 32 |
| Another New Plant for Pasco Wire Wheel Firm..... | 34 |
| Dayton Chainless Starter Spins Engines of Ford Cars | 42 |
| The Home of Ever-Tyte Bill | 44 |
| Kansas Dealer Has New Plan for Shipment of Automobiles | 48 |

DEPARTMENTS

| | |
|---|-------|
| In the Tire World | 28 |
| In the Truck and Trailer Field..... | 32 |
| How to Make the Shop Pay | 34 |
| Tractors and Farm Lighting | 36 |
| Mechanical and Engineering Problems | 38 |
| Welding, Cutting and Brazing | 40-42 |
| Accessories and Garage Equipment | 46 |
| Buyers' Reference | 60 |
| Index to Advertisers | 61 |

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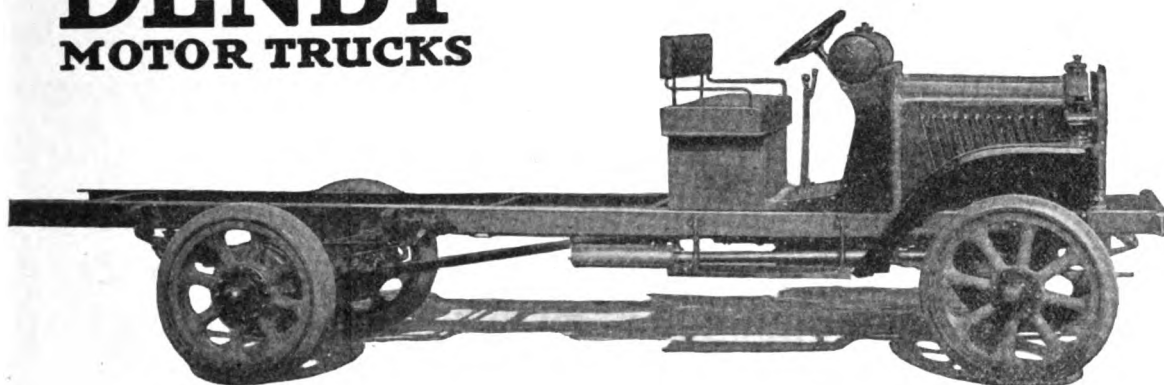
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G. M. ALLEN, *Mgr. Copy Department*.
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Entered as second-class matter, March 1, 1916, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

Subscription per Annum (Postage Paid) \$1.00. Advertising Rates on Request.

DENBY MOTOR TRUCKS



The Truck of Wide Utility

This 2½ Ton Denby probably meets the needs of a wider range of business than any other truck. For it is the "in-between" size of capacities—sharing alike the speed and large territory covering ability of the light vehicle and the great tonnage handling of the big unit.

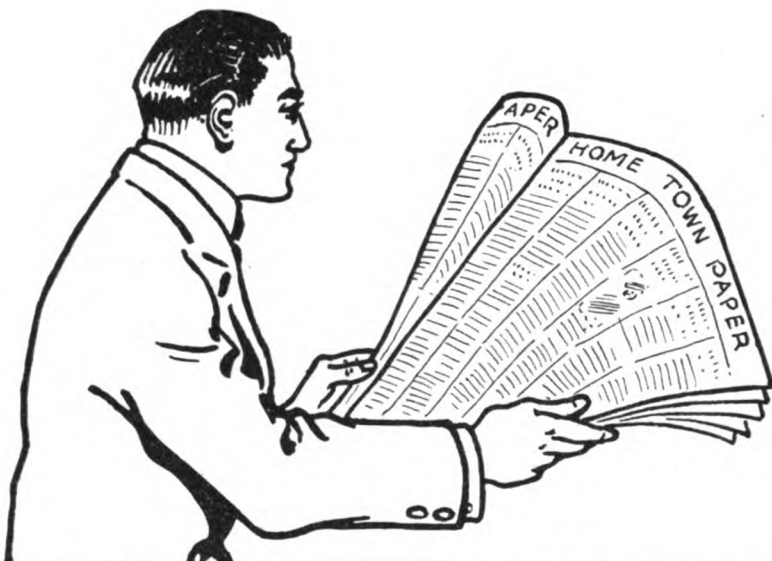
This new 2½ Ton Denby combines the advantages of both types in an unusual degree. It weighs but 4450 pounds, and has a speed of 12½ miles per hour at 1275 revolutions of the motor per minute—factors that allow a wide radius of operation and assure excellent economy of fuel.

A frame 5½ inches deep; long flat spring of unusual width; a load carrying axle of chrome-nickle steel, 3 inches in diameter; wheels of cast steel, shod with larger tires than are customarily used on a truck of this size: these features assure long life and freedom from trouble.

It has ample power for the hardest work it can be called on to do, with a motor of 35 horse-power; a four speed transmission and the unequalled Denby internal gear rear axle.

*The Denby Line is Complete
Ranging from 1 to 5 Tons*

Denby Motor Truck Company, Detroit



TIRE-DOH will be advertised in *YOUR* local newspaper to create a demand among your customers.

Where accessory and hardware dealers, garagemen, and repairmen become TIRE-DOH dealers, we will agree to carry a regular amount of TIRE-DOH advertising in your local newspaper—over your signature—to “tie you up” to the national demand existing for TIRE-DOH so that you too may derive your share of this profitable business.

If you wish to “cash in” at once on spring and summer business for TIRE-DOH write immediately for further particulars about our TIRE-DOH sales, newspaper - advertising - offer, and dealer discounts.

Right now we want “more” **TIRE-DOH** dealers

THE BUSINESS
possibilities for
TIRE-DOH sales
are tremendous.

Though we have 10,000 good dealers now, we are anxious to secure a few more dealers who will help us supply the demand we are creating through our national advertising.



Atlas Auto Supply Company
680 W. Austin Ave. CHICAGO, ILL.

Just the Thing for the Following Repairs:

| | |
|----------------------|-----------------------|
| Inner Tube Puncture | Exposed Canvas in |
| Motor Cycle Tire | Casings |
| Troubles | Torn Out Valve Stems |
| Inner Tube Rips | Blisters in Casings |
| Inner Tube Blow-outs | Cuts in Casings |
| Inner Tube Splicing | Tears, Holes and Cuts |

AMERICAN GARAGE & AUTO DEALER

Comprising
AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE, GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL

Vol. X, No. 3

CHICAGO

March, 1919

**Spring
will
soon
be
here!**

**Make It Mean EVERYTHING in
the Growth and Strength
of Your Business.**

See page 16



BUY IT NOW

U. S. Council of National Defense Helps Movement to Stimulate Immediate Purchases of Necessities

Everywhere throughout this country keen business men are backing the "Buy Now" movement and automotive merchants can do much to help the carrying out of the idea. The plan has won enthusiastic approval at the National Capital and Grosvenor B. Clarkson, Director of the United States Council of National Defense, has issued the following statement:

"The U. S. Council of National Defense, composed of the Secretaries of War, Navy, Interior, Agriculture, Commerce and Labor, has begun a nation wide campaign urging the people of the country to buy only what they need, but to *buy it now*.

"The Council's action is based on the general industrial situation. In the Northern states unemployment is present because of suspension of outdoor work. Workers on outdoor improvements have crowded into the congested cities and are finding more or less difficulty in getting temporary employment. There is business hesitation normal to post-war readjustment. Prices are to some extent declining. Men hesitate to buy materials and supplies on a falling market. This means stopping work in some places and reducing amount of work done in others. Return of soldiers in quantities adds for the time to the problem.

"Without expressing undue alarm, the Council of National Defense believes that the situation invites the activities of certain restless elements of society. The Bolshevik takes advantage of idleness. Empty stomachs and purses create his opportunity. His fellow, the I. W. W. agitator, seizes the same occasion.

"There is a great volume of business waiting to be done in America. Private stocks of all kinds are low. The country's means are ample and when the full flow of private buying begins, there will be business for all. But it

may take several months to bring this about, and action is needed now.

"Our commerce rests upon the personal purchases of individuals. If all were to stop buying there would be no business. It is called good business to delay buying until the market reaches bottom. If economic law alone were now concerned that would be right action. But there is directly involved at this moment the saving of men from unemployment and the social consequences to them and to the country.

"There must be no waste. We must still save. Taxes are coming and there will soon be another loan. The middle course that the Council urges is: Buy only what you need, but *buy it now*. If this course is followed commercial springs of action will be tapped and a real danger averted."

In a recent issue, *Hardware Age* declared its belief that this would be a good business year in an editorial styled "Bumper Crops and Bulging Barns Insure Big Business," which included the following:

"No man has ever seen a bad business year in the United States when there were good crops that sold for high prices.

"The farmer is America's biggest business man. The products of the farm make Rockefeller's millions look like small change. Oil isn't a drop in the bucket when stacked up against eggs and butter, and these two items are only by-products from the mill of his majesty, the American farmer

"Two dollars and twenty-six cents a bushel, f.o.b. Chicago, was and is the guaranteed price for wheat. That price stands for 1919. Pigs are selling for 17½ cents a pound on foot.

"Now the farmers' food factories are all tuned up. They are operated by trained forces. A lot of farmer boys are shedding khaki to slip into

their old working clothes, and the crop prospects are simply enormous. There is 16 per cent more winter wheat in the ground right now than is planted in normal years.

"The acreage of spring wheat will crack all records to smithereens. The American wheat crop of 1919 is going to smother the Bolsheviki so completely that he won't even come up for air after it starts coming in.

"It has been estimated that there will be a billion-bushel crop. Think of it—a thousand million bushels of wheat! We would not be at all surprised if this estimate should prove small. It is quite within the realm of possibility that the crop may harvest 25 per cent more than the billion estimate.

"If you want a breath of optimism, get out of the cities, get away from the factory towns, bid farewell to the theater district and the contamination of the cabaret and go out where Almighty God surrounds mankind with an environment in which he can see clearly and work well.

"Our big business year is starting on the farms. Already it is beckoning to the small-town dealer. He is just beginning to feel the impetus of the tillers of the soil. He is already going out after paint sales. He is pushing his automobile accessories. He is displaying his implements and tools. His seeds are on display and moving rapidly. He is selling victrolas, but his cash register is making more music. Find a pessimistic merchant in a farming town and you will have uncovered a freak. If inborn fear, if hallucinations of our own imagining are going to grow a goblin to chase us in panic from an open invitation to participate in the fruits of this great business year, then we are not fit partners for our fellow citizens who go to bed with the chickens and wake up with the rooster."

Trucks Not a Temporary Line but Permanent Profit Source

BY JAMES LEVY.

President

James Levy Motor Co.

Motor car dealers who took truck agencies during the war when it seemed as if they could not get enough passenger cars to keep going

should not drop them now that they are assured of obtaining cars for at least part of their customers. Motor trucks ought not to be regarded as merely a temporary line, to tide over an emergency, but as a permanent



James Levy

source of profits when receiving proper and careful merchandising attention.

I have heard of many dealers in different cities who entered the truck sales field with great enthusiasm in war time. They could get few or no passenger cars but were told that trucks, in limited numbers, would be available for sale to firms engaged in "essential industries." But now some of these men are reported as having lost much, if not all, of their recent interest in commercial motor vehicles, because they found trucks could not be sold as easily as they had formerly been able to dispose of popular passenger vehicles.

Motor truck selling, in my opinion, should not be regarded as a stop-gap to bridge over a hard period in a man's or concern's business of car selling. It ought, on the contrary, to be looked upon as a "big business" undertaking and so receive careful consideration. It should not be dropped after having served to fur-

nish the sales total needed to keep an establishment running without loss when war demands stopped the production of passenger cars for civilian purposes.

Trucks Filled Empty Floors.

When there were few or no new passenger cars to be had many automobile agents were only too glad to get trucks to display on the floors of showrooms that otherwise would have been bare. Now I have heard that a few dealers declare that "passenger cars have crowded the trucks off their floors." So they are ready to give up all the benefit of the work, time, energy and money put into advocating commercial motor vehicles by themselves and their organizations.

"Trucks are hard to sell," is the excuse or reason given by some dealers who have lost most of their interest in handling them. It may be hard for salesmen who have never sold anything but passenger cars to dispose of trucks. But it should be realized that the reasons for buying trucks have little or no relation to those that prompt the purchase of passenger cars and so different types of men are best for marketing the two varying classes of motor vehicles.

We took the agency for the Fulton truck about a year ago, at a time when

our chances of getting many new passenger cars were very slim. But now that we are once more getting passenger cars in reasonable quantities, though not near as many as we would like, my business associate, C. E. Gregory, and I have never thought of giving up the customers and prospects that we accumulated.

But we do think that the truck business, so far as we are concerned, will do better if conducted as a separate organization. I think this belief will be shared by most big city dealers who have been handling trucks and cars together from the same showrooms originally devoted exclusively to passenger car retailing. In smaller cities and towns it seems to me that the best results will be had by keeping cars and trucks together, and adding trailers, truck-makers and tractors.

Accordingly we are forming a separate company to handle the Fulton truck. It has obtained a lease on a showroom at 3518-3520 South Michigan avenue, where day and night service facilities will be available for users. The vice-president and general manager will be H. E. Rose, who until recently was sales manager for the Fulton factory but who was released to join us by President W. F. Melhuish, Jr.

Advice on Buying a Truck.

There are several sources of information which may be helpful to the man contemplating the purchase of a motor truck.

Previous personal experience of the operator is exceedingly valuable. Experiences of other operators may often be had for the asking. Motor-truck manufacturers will be glad to furnish prospective purchasers with such information of this nature as may be available. Data secured from truck manufacturers very often do not indicate the conditions under which the figures were obtained.

Information thus offered is usually an honest attempt to aid buyers but almost invariably there is too much generalization to make such figures a very valuable basis of estimation.

Many cost statements issued by truck companies do not take into consideration the varying classes of highways over which trucks run, variations in the load, total monthly or yearly mileage and other important factors.

A bulletin recently issued by the U. S. Department of Agriculture's Bureau of Markets, "Motor Transportation for Rural Districts," will aid the prospective operator. It will be sent free on request.

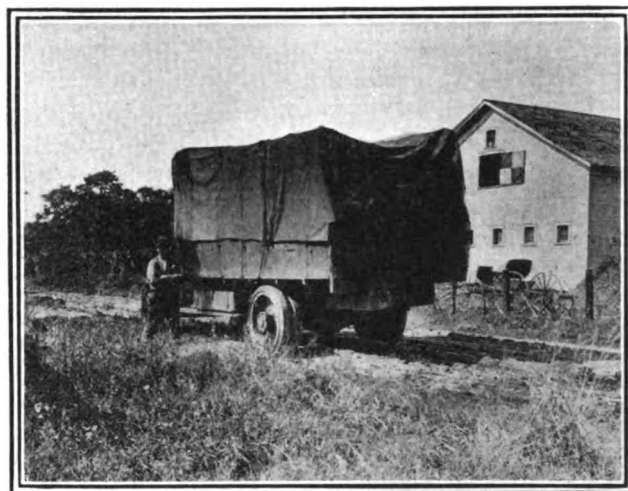
Rural Motor Express Solves "Short Haul" Transport Problem

Hauling farm produce to market in motor trucks represents one means of the successful solution of the "short haul," one of the most difficult problems which confronts the transportation expert, reports the Bureau of Markets of the U. S. Department of Agriculture in a recent publication, "Motor Transportation for Rural Districts." The failure of railroads to keep pace with the expansion of the short-haul business; the development of the producing areas adjoining the larger cities in proportion to the production demand asked of them; and the upbuilding of the motor-truck manufacturing activities, as well as the recent war emergency crisis, have popularized this method of moving farm produce to market.

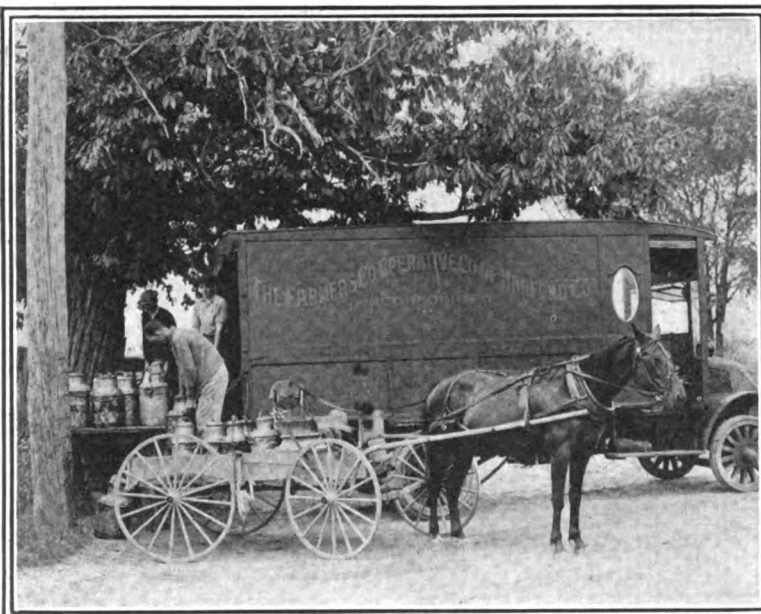
The Bureau of Markets conducted an

such a diversity in the hauling agencies, there is a similarly wide range in their methods of doing business.

Pioneers have made mistakes which should teach valuable lessons for their successors. For example, too many ambitious motor men buy their trucks first and then make a study of local conditions and the prospects for the development of a profitable and permanent hauling business in their communities. They



An open-top stake body, with loose canvas cover, carries a large load of grapes, but is not the best type of body for hauling perishable products.



The farmers of Harford County, Maryland, operate a motor truck route for themselves with entire success. This is one of their roadside loading platforms, to which the farmer brings his milk by a short haul, and the truck takes it to Baltimore.

extensive survey of 60 rural motor routes to ascertain the defective practices and as far as possible to suggest improvements which would stabilize the industry. The bureau found that rural freight is hauled by the farmer who owns a truck and handles his personal marketing as well as that of his neighbor by motor; by the local truck operators who haul farm produce as a business; by the local automobile or truck agencies that operate transportation trucks as a side-line; by the city transfer company which also engages in rural hauling; and by the large corporation which operates a fleet of trucks over a wide range of territory. Naturally with

neglect to inventory such critical conditions as the volume of farm products produced along the contemplated routes, the volume of miscellaneous hauling supplementary to regular loads; the competition of other carriers and the character of the highways over which the trucks must run.

A motor-truck route established in a sparsely settled or non-produc-

tive region is foredoomed to failure, advise the experts of the Department of Agriculture. At least a potential supply of commodities must be available for hauling if there is to be sufficient business to make the route a paying one. A region devoted to the production of a few staple crops which move to market during a comparatively brief season will not provide business for a permanent route. For successful operation a reasonably dependable tonnage is essential throughout the years.

Kinds of Products Affect Costs.

Regions devoted to truck farming or dairying provide rich fields for motor-truck operation. However, consideration should be given to the nature of the products to be hauled, as low-priced, bulky staples may not stand the transportation charges necessary to maintain a route. For illustration, it is unlikely that hay can be transported by motor truck for long distances except under unusual conditions with respect to price.

Perishables may stand the motor-truck tariff if the



Celery in crates is easily carried in most kinds of trucks.

transportation service to market is speedier than the customary means of transportation. Such commodities as cream, milk and eggs which are high in price as compared to bulk, may bear a reasonably high transportation charge if more satisfactory facilities are offered.

Study Prospects Before Starting Route.

The back haul or return trip which often is made without a load, constitutes an extravagant practice which truckmen should strive to avoid. Attention should be concentrated on the problem of arranging for freight so that there will be a profitable load on all trucks whenever they are operated.

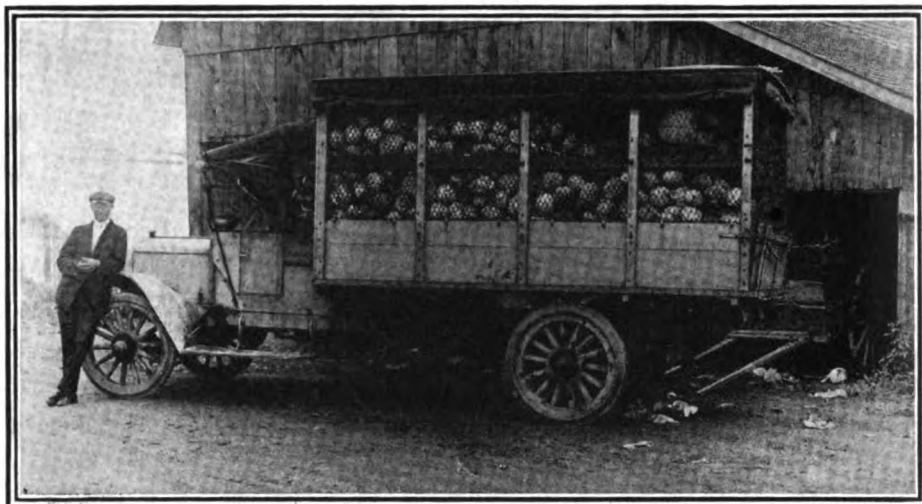
Keen competition is another factor in motor-truck service. Some operators have found it possible to compete successfully with rail service and yet to charge rates rather higher than were charged by the customary carriers. Such conditions, however, are only possible where the service is developed on a most extensive scale. Freight and express schedules in some districts have been unsatisfactory to shippers recently, and by offering a more prompt and speedy service, truck owners have developed a very satisfactory business that ordinarily would be handled by rail.

Good roads are a prerequisite to successful motor-truck operation. Very few operators appreciate the increased expense which results from travel over poor roads. The unfortunate operator who tries to maintain his services over highways which are virtually impassable and unsatisfactory has found that his daily operation costs far exceed the average normal expenses and seriously affect his profits.

Depreciation and Operating Costs.

The man who plans to operate a motor truck should have a good working knowledge not only of his engine, but the entire machinery in general. The wages paid drivers vary in different sections of the country and for trucks of different sizes, ranging from \$2.75 to \$7.50 a day. Depreciation is one of the heaviest annual expenses with a motor truck, a loss of from 20 to 33½ per cent of the cost of the truck each year being required to cover this charge.

Data collected by the Bureau of Markets show that the annual cost of overhauling and repairing the trucks ranges from \$100 to \$900 a year. Those truck operators who make it a point to keep their machines in a constant state of repair have relatively small charges to meet for annual overhauling. On the other hand, those who operate their trucks as long as possible with no regular repairs often have to pay a very heavy overhauling charge at the end of the year. Tire expenses, garage rent, taxes, licenses and insurance, overhead expenses, repairs and equipment all swell the annual maintenance costs.



The cabbages and cucumbers in this truck load will travel 20 miles to Buffalo, N. Y., and arrive in good condition. The wire netting all around holds a large load in place.

Rates for Hauling.

In some sections there are as many different systems of computing rates and charges for hauling as there are motor trucks, each owner having an original way of figuring his transportation toll. There are several factors which should be considered in the establishment of rates in any district. The value and the fragility of the load bear a direct relationship to the rate that should be charged. Very valuable or fragile loads involve the greater risk on the part of the carrier and the tariff for the carriage of such goods should be sufficiently high to offset the risk involved. The length of the haul naturally is another prime consideration.

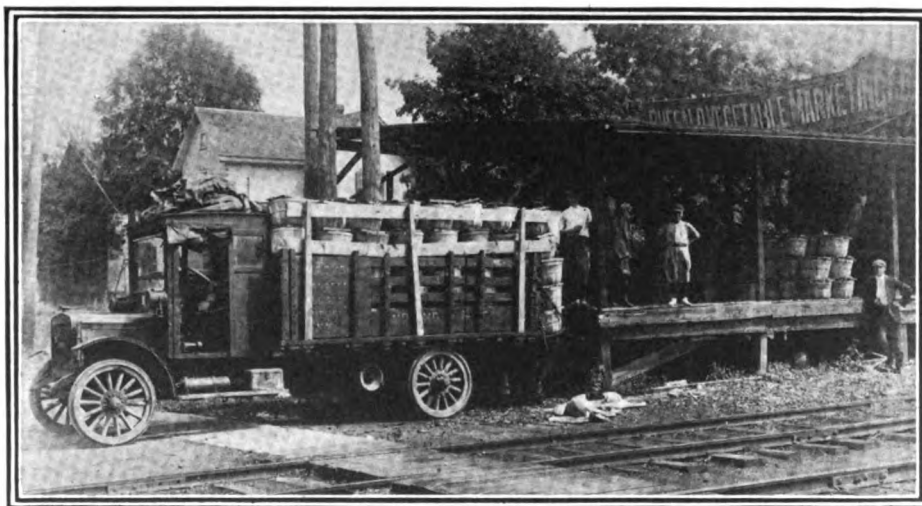
Road conditions directly affect operating costs and hence must also be considered in establishing rates. The perishability and bulk of the load must be taken into consideration. Where complete delivery is made from the door of the shipper to the door of the consignee, and service is rendered which is not duplicated by the railroad, this additional service must be con-

sidered in fixing the rate. Practically no rates have been established on the basis of cost plus a reasonable profit. A satisfactory rate must be one which is low enough to attract business and high enough to offer a reasonable profit to the operator. Where conditions do not permit the establishment of such a rate, care should be exercised in starting a route.

Collecting and Delivering Freight.

Farm-to-farm collection of freight is practiced on short rural routes where comparatively few stops are ordinarily made. Such collection is costly both in time and gasoline and hence necessitates higher rates. The cross roads collection system is popular also, the shippers centralizing their produce at certain points where it can be loaded on the trucks. The central assembling method where the shippers concentrate their freight at one point or where a lighter, auxiliary truck collects and delivers it is worthy of trial, as it possesses many efficient features. The delivery of

(Continued on page 15.)



The peas in this load will go directly by motor truck to the dealer at the market 15 miles away and arrive in fresh condition. This is a concentration platform, to which perishable products are brought from all directions.

Heavy Duty Roads Needed for Commercial and Martial Uses

One of the most imperative needs of this country is a well planned campaign for the establishment and maintenance of a country wide series of heavy duty highways, Carl H. Page of New York City declared during a recent visit to Chicago. His conversion to the good roads idea is not a recent one because about three years ago, when he was a passenger car distributor in New York, he advocated the building of roads strong enough to carry the heaviest trucks and their loads. Mr. Page took this stand at the time when there were movements in some of the eastern states to limit the size and weight of motor trucks on country roads, owing to the claims of some State road officials that the heavy trucks were ruining their "improved" highways.

At that time Mr. Page called attention to the fact that the highways along the seacoast ought to be built strongly enough to stand up under heavy trucks and tractors hauling troops, guns and munitions from one city to another. He pointed out that if there were a large body of troops at New York that were needed in a hurry at Philadelphia it would be almost impossible to get them over in the event that a few railroad bridges across Newark Bay were destroyed, as the railroads running from New York to Philadelphia all cross Newark Bay over bridges. He declared that there should be a number of solidly built, wide highways between all of the cities along the coast so that troops and artillery could be moved over them if the railroad bridges were destroyed.

At the present time Mr. Page thinks there should be a national highway board with authority to plan a series of national roads. He thinks that the proposed national highway organization should be supplemented by another board made up of representatives of each state in the union. He thinks that this is the only practical way to be sure that a remedy

will be found for the need of more improved highways of a proper type of construction.

Soldiers Understand Roadmaking.

At the present time this country has more men who understand the planning of road projects and the carrying out of this kind of work than ever before because of the great number of our soldiers who were or are engaged in road building in France for war purposes.

Mr. Page believes that thousands of the returned soldiers would welcome the chance to be employed on the building of national highways in the United States. He is of the opinion that the employment of as many soldiers as wish to do this kind of work, as well as many former war workers who would welcome a chance for healthy, outdoor labor, would be one of the best possible things for every one concerned. He says that if road building were started at once in districts where the weather would not delay it that the business welfare of the country would be benefited by the immediate employment of so many men. At the same time the improved highways that would be the result would provide the chance for a quicker but permanent farming and industrial growth of the states where the roads were improved.

The necessity of getting these roads is so great, in Mr. Page's belief, that he has suggested that members of the National Automobile Dealers Association and all of the local and state trade organizations throughout the country should take steps to add their influence to the efforts of the American Automobile Association and other bodies that have labored so long for the improvement of American public highways.

Big Magazines Help Movement.

Some of the big national magazines are taking up this campaign for the establishment of heavy duty roads,

and in its issue dated March 8 Colliers has an article on "Good Roads for Defense," written by John S. Crandell, formerly professor of highway engineering at the Pennsylvania State College. Mr. Crandell declares that we never have had a comprehensive system of national highways, and have never had any system at all. He points out that the ocean shore lines of the United States are 21,354 miles long, and the mileage of roads in the entire country is something more than 2,000,000, so that the entire area has only 10 times as many miles of roads as the length of the shore lines.

Professor Crandell advocates that the government should encourage young men to take up the study of highway engineering, saying that men need to be trained for the work.

The last two paragraphs of his article in Colliers read as follows:

"But there should be no need for the through roads to be built in rush jobs. We know what is needed, and we know how long it should take to build the necessary mileage of good roads if the money is appropriated for them. We know too what could very easily happen to us if enemy hordes swept down on our unprotected shores. The only consolation that we can call to mind is that they would be stuck as deep in the mud as ourselves.

"What we need is a system of government roads—government-built and government-maintained—that, meeting modern traffic conditions, will be useful in time of peace and necessary in time of war."

Restricting Truck Size a Menace.

Secretary of the Interior William C. Redfield has said that he regards legislation to restrict the size of motor trucks in order to save the roads as a menace to development of highways transport as intolerable as it would have been to have stopped locomotive development forty years ago because engines and cars were getting too heavy for the light rails of those days. Our transportation routes must be fitted to the new tools, he declared.

Jobbers, Acquitted, Adopt New Declaration of Ass'n's Purposes

Following the acquittal of 21 members on charges of violating the Sherman Act, the officials of the Automotive Equipment Association—formerly the National Association of Automobile Accessory Jobbers—decided upon the adoption of a declaration of principles for the organization. It was deemed advisable to make perfectly clear the objects and purposes of the Association because the prosecution erroneously undertook to give a wrong meaning to some of the resolutions adopted at conventions of the organization.

Commissioner Wm. M. Webster accordingly sent to all members of the body the resolutions given below, requesting them to vote upon each of the six declarations in order to avoid, in the future, all possibility of a misconstruction or misunderstanding regarding the principles of the Association.

The ballot sent to members reads as follows:

"RESOLUTIONS FOR THE PURPOSE OF DEFINING AND MAKING CLEAR THE PURPOSES AND OBJECTS OF THIS ASSOCIATION."

"WHEREAS, The trial in New York, at which certain members of the Association were charged with violating the Sherman Act, has resulted in their acquittal, and,

"WHEREAS, At that trial it was attempted to place upon the Constitution and By-Laws of the Association, and upon certain resolutions heretofore adopted by the Association, a meaning which the members of the Association never intended they should have; therefore, be it

"RESOLVED, That this Association declare:

"First—It is not now and never has been intended that adherence to any price or schedule of prices or discounts, or to any agreement, or any understanding as to prices, should be deemed an element in determining eligibility to membership in the Association.

"Second—The list of jobbers prepared by the Association was issued solely for information. It has never been, and is not now, the intention of the Association that the question of adherence to any schedule of prices or discounts, or any understanding with reference thereto, should be considered in the preparation of that list.

"Third—The so-called resale price resolution is hereby rescinded. The Association never intended it to be more than an expression of opinion as to the wisdom of adopting legisla-

etc., were not and are not now intended to be binding upon the members in the conduct of their business. Their sole purpose was to call attention to certain trade evils and abuses, the facts with reference to which were established at the trial, and to point out better methods of proper merchandising.

"Sixth—The Association has always endeavored, and will continue to endeavor to adhere strictly to the law; its books have been and are now and always will be open to the inspection of the authorities. It welcomes suggestions and will comply with all reasonable and lawful directions on the part of those charged with the execution of the laws."

Tires of All Sizes Will Be Made Again

Announcement has been made by the National Automobile Chamber of Commerce that, at a joint meeting of representatives of tire and automobile manufacturers February 13, it was decided that all restrictions that had been adopted as a war measure on the manufacture of certain sizes and styles of pneumatic tires for renewal purposes would be removed and that tires of all sizes would be made as long as there is a demand for them by the public.

tion which has been recommended by the Chamber of Commerce of the United States and other similar bodies, and it was so considered in the activities of the Association.

"Fourth—In its definition of a jobber and a manufacturer, the Association never intended, and does not now intend that they should include anything except the ordinary meaning attached to those terms in the business world generally.

"Fifth—The resolutions adopted from time to time as to trade practices, such as terms, payment of bills, purchasing agencies, mail order houses, motor leagues, catalogues,

Rural Motor Express Solves

"Short Haul" Transport Problem

(Continued from page 13.)

the goods at their destination may be handled very satisfactorily in a similar manner.

The small-scale truck line usually collects the charges when the freight is accepted, while the more elaborate systems which haul regularly for different patrons submit weekly or monthly bills. It is essential that each truck operator, no matter how simple his system, should keep a record of his expenses. The Bureau of Markets, in an investigation of over 60 rural motor routes, ascertained that many operators who kept no accounts thought they were making a profit, when, as a matter of fact, they were gradually exhausting their original investment for current expenses.

Rural hauling by motor is limited and restricted by the operation costs as compared with those of railroads, electric lines and boat routes. The truckman must practice every possible economy in order to minimize his expenses which will be reflected in his charges.

Truck routes are only adapted to sections in which the roads are good, as poor roads are an insurmountable obstacle to motor freighting. Furthermore, truck operators must be financially responsible for the goods they carry. Consequently they should be protected by adequate insurance. It is only by such practices that a permanent and certain business can be developed.

Spring Will Soon Be Here!

Spring time; with its first robin, the budding leaves on the trees, and the awakening desire of many folks to buy a new automobile or fix up their old one, will soon be here. Energetic automotive dealers should begin to make plans now to take advantage of the opportunities that will soon be knocking at their doors.

While the spring house cleaning habit of so many women often causes temporary inconvenience to the men of the household, none of the latter will deny that their homes have been improved when the process has been completed. This spring house cleaning idea is one that could be followed out to advantage by every automotive merchant whether he sells passenger

cars, trucks, trailers, truck makers, tires or accessories or operates a repair shop or service station.

While it is true that paint has increased in price, along with everything else, careful washing will often restore painted wood work to the extent that it will not be necessary to cover it again with paint. When it seems advisable new coats of paint should be applied, because a well painted establishment, whether a car show room, accessory store, garage or service station will get a lot of business that would have gone to some other merchant had it been left in a dingy condition.

In this preparation to get a share of the money that will be spent in

Spring time buying, the automotive tradesmen should make use of advertising in his local newspaper and circular letters. Even the telephone should be used in cases where customers can be better reached that way than through newspaper advertising or by mail.

Another way to take advantage of the buying that will soon begin will be to ask accessory manufacturers and jobbers for suggestions as to the best ways to fix up windows. A window display of accessories that will make cars operate easier or more economically or ride more comfortably will help make sales, especially if some pictures of automobile touring parties are used in the windows.

New Tax Rules in Force on Cars, Trucks and Accessories

Automobile provisions in the new Revenue Act, signed by the President February 24, became effective next day and the National Automobile Chamber of Commerce is sending particulars to makers and dealers in the automobile industry.

The new law continues the 3 per cent tax on the manufacturers' selling price for "automobile trucks and automobile wagons" and adds a provision that all tires, parts and accessories sold on or in connection with such trucks and wagons are considered part of it in estimating the tax.

The law increases the tax on the manufacturers' selling price of passenger automobiles to 5 per cent, with the same provision that tires, parts and accessories sold on or in connection therewith are to be included in estimating the tax. There is a similar 5 per cent tax on motorcycles, but no tax on tractors nor on tires, parts or accessories therefor.

There is a new tax of 5 per cent on the manufacturers' selling price of tires, parts and accessories when sold separately, except that such tires, parts and accessories sold by their makers

to automobile manufacturers or motorcycle manufacturers are not taxable. This exception is apparently to prevent double taxation.

In addition to the above taxes on sales there are taxes at the same rates on the leasing of cars, tires, parts and accessories therefor by their makers.

There is no floor tax or tax on motor fuels, nor is there any direct tax on car users except that persons carrying on the business of operating or renting passenger automobiles for hire are taxed \$10 annually for each automobile seating more than one or less than eight passengers and \$20 a year for automobiles seating more than seven.

The tax situation regarding the exporting of automobiles, tires, parts and accessories therefor, is changed, so that under the new law all such articles "sold or leased for export and in due course exported" are not subject to the tax. This is in compliance with the Federal Constitutional provision against taxes on exports.

There are some complicated provisions in Section 1312 of the new law to the effect that on contracts for the sale or lease of cars and parts, etc.,

made prior to the date when this new law was first discussed in Congress, the purchaser or lessee must reimburse the seller or lessor for the tax that the latter has to pay.

Those liable for the tax on automobiles, tires, parts and accessories, must make monthly returns under oath in duplicate, to the local collector of Internal Revenue and pay the taxes due to this collector without further notice. If the tax is not paid when due there is added a penalty of 5 per cent together with interest at 1 per cent per month. In case of over payment of taxes, the Revenue Bureau may return the over payment.

The tax on automobiles, tires, parts and accessories becomes due when the article is sold or leased. This means, in the case of sales, when the legal title passes from the seller to the buyer or when the article ceases to be the property of the seller and becomes the property of the buyer, and in case of a lease, the lease is effective generally when the lessee receives possession of the article. Therefore, all sales and leases by automobile manufacturers and accessory manufacturers made on and after February 25, are subject to the tax rates of the new law. All sales and leases made prior to February 25 are either tax free or subject to the old tax rate, as the case may be.

ACCES\$SORIES

BY M. E. FABER.

Everything points to a bigger year for accessories than the trade has ever seen. With car prices still high, a great many motorists are going to make the old car run through one more season. They are going to be willing to spend some money, too, to make it run better or more comfortably. There will be more polishing and tinkering than ever before.

What have you in your stock to sell to the man who plans to make the old car do? Check it up right away and write to the manufacturers for displays and advertising material that will let your customers and the other fellow's customers know what it is and why the car owner should have it.

Make it a rule this year that no piece of mail that goes out of your office fails to carry at least one circular that describes some article you have to sell.

Make another rule that no customer gets out of your garage without your having called attention to at least one accessory that she or he ought to own.

Ask a few accessory manufacturers when their big advertising drives are to appear in the national publications. Plan to feature window displays of their products at the proper time so that your customers who are interested by the advertising they see in the national magazines will know that your store is the place where the articles may be secured.

The time is here when the garage man must decide whether he is going to be the accepted channel for the distribution of accessories or whether he is going to let the hardware store grab off this easy money. Hardware dealers are harder pressed than they have ever been to make money in their accepted lines.

The jobber's salesman has to make a living by selling his goods to some one. If, after all these years of his urging you, he decides that it is hopeless for him to wait until you are ready to take accessories seriously and handle them on a merchant-like basis, he goes to the hardware store across the road and gets the hardware man to do what you ought to have been doing these years past, you will have nobody to blame but yourself.

Start your drive early. Make your place the local headquarters for accessories. Make it a place where women will want to buy as well as men. Don't forget that the feminine trade is becoming more important every day and that Mr. Motorist's wife is even more likely to buy little conveniences that make the car easier to drive than is Mr. Motorist himself who may be inclined to let well enough alone.

NEW SPEE-DEE COUNTER DISPLAY.

The States Chemical Co., 680 W. Austin Ave., Chicago, has just completed a very unique and artistic looking Spee-Dee counter display card. This is different from the ordinary display cards, because it not only serves as a base for exhibiting a can of Spee-Dee, but it prominently iden-

tifies the product with the illustration showing its practical application in the shop, in the garage, and in the household.

This counter display is made up of four colors—red, yellow, blue, and black—and will make a conspicuous business-catching solicitation for Spee-Dee. Interested dealers may obtain it by writing to the States Chemical Co., Chicago.



Bigger Output Planned for Vulcan Spring Plant

"We claim the distinction of being the pioneers in the replacement field," says President T. B. Jenkins, of the Jenkins Vulcan Spring Co. "Our niche is an important one in the motor world and is clearly emphasized by the ever increasing demand for reliable replacement springs. Ten years ago probably motorists would have scoffed at such an apparently absurd idea as devoting a business exclusively to springs for replacement purposes. But springs do break and at most unexpected places and with the millions of cars operating the demand has compelled us to keep right on growing."

The present Vulcan plant at Richmond, Ind., has a floor space of 60,000 square feet with a monthly production capacity of 400 tons per month. There is now in course of construction a new concrete and steel plant 350 feet by 350 feet with an area of 125,000 square feet of floor space. When completed the monthly capacity will be 2,000 tons.

The selling force is being increased in proportion to the production. The present road organization of twelve men will be increased to twenty-five by June 1. Six selling branches, with spring experts in charge, are maintained, and more than 6,000 dealer agencies throughout the country. W. B. Edwards, formerly in charge of sales at Reading, Pa., has been appointed assistant general sales manager with headquarters at Richmond.

Thoroughness and Thrift are two lessons which the war has taught us. What is worth doing is surely worth doing well, and the conservation of small things in the aggregate counts unbelievably.

EDITORIAL REMARKS

Heavy Duty Roads Needed

Automotive tradesmen must work tirelessly to educate their customers, neighbors, U. S. Senators, Congressmen and other law makers regarding the necessity for heavy duty roads. With the increase in the number and carrying capacity of motor trucks all over the country, it is not enough to simply work for improved highways, as too many of the so-called good roads of the past have not been constructed to stand up under the rapidly growing motor truck traffic. City streets and country highways that have been surfaced with asphalt or some bituminous mixture, mounted on a shallow concrete base, do not last very long when they are much used by heavy motor trucks. They soon give out and thus afford an opportunity for reluctant tax payers to say that good roads are too expensive.

Leaving out of consideration the fact that a country should have broad, solidly built highways strong enough so artillery can be hauled over them, the growing needs of business demand not only improved highways from one end of the country to the other, but the betterment of highways leading from the farming districts into the cities. One feature of good roads is that they will benefit both the farmers and the dwellers in cities. When good roads connect farming districts with cities the farmers can make a profit by sending produce to the cities that otherwise would be utterly useless or good only for feeding to cattle or pigs. The city folks benefit because there is a greater supply of farm produce, and when brought in over improved roads it is fresher and cheaper than if carried by the more involved and generally slower and dearer method of railroad freight transportation.

Buy Now

The United States Council of National Defense, through the 184,000 local councils, is urging the people to adopt a "buy now" program. This is to stimulate business judiciously during this time of hesitation and waiting while the country is returning to normal conditions.

It is a wise move. There is a great volume of business waiting to be done in America, and prosperity will be correspondingly great when the readjustment is completed. Too much hesitation, however, and waiting for lower prices tend toward stagnation and unemployment, and they encourage agitation and unrest—in other words, bolshevism.

We must still be thrifty. We must save, not waste. Hoarding is dangerous. Buy carefully, but buy now, should be the motto.

As the council says: "The nation is in a period of transition from a war to a peace basis. To make this transition quickly, it is necessary that the people of the United States understand the necessity of *buying what they need now.*"

This applies to everybody connected with the automotive industry in any way. It is human nature to delay, hoping for lower prices, but if everybody did that what would be the result? Stagnation, of course. It is up to us all to "loosen up" judiciously and keep the wheels turning steadily until we are over the hill. The rest of the journey will be easy.

Stimulating Business

It is a good sign that the government has instructed the regional directors of railways that they may begin to buy rails again. This means stimulation of business in a line that was stagnant on account of the "buy nothing" policy that was adopted during the war.

The railroads need the rails, the steel mills need the orders, and the labor market needs the employment that will be required to fill these orders. A return to normal activity among the railroads will help general business throughout the country and, it is hoped, will lead to the resumption of normal times in all lines of industry.

There has been too much holding back by United States business since the war ended in November. It was natural, perhaps, for everybody expected lower prices and was inclined to wait until they dropped before branching out in after-war operations. This has led to a considerable lack of employment and a slowing up in most lines. Besides, many have waited to see what was going to happen before getting busy again. This is a narrow policy that will unnecessarily delay a return to the full tide of prosperity which this country should enjoy.

"When we consider the happy situation of our own country and the tremendous needs of the rest of the world, what reason can be assigned why the United States should not immediately enter upon a great era of good times?" asked a well known Chicago banker recently. "There is enough work waiting to reconstruct Europe and feed and clothe its people to keep every factory, mill and wire in this country busier than they were even while the war was in full blast. Instead of slowing up now, we should be speeding up. The man who has not faith in this country's prospects should be deported along with the I. W. W.'s."

Strong language, but it contains sense as well as patriotism. It was J. Pierpont Morgan, the elder, who said he made his fortune because he never was a bear on the future of the United States.

In an address read before the Trans-Mississippi Readjustment Congress at Omaha, J. Ogden Armour, the packer, said: "I am strongly of the opinion there would hardly be enough labor to go around were it not for the spirit of hang-back on the part of the man with capital and the spirit of hang-to on the part of the wage-earner. A hold-back policy, if followed widely, would bring on

the very thing we seek to prevent—and industrial depression. Capital must not lie low until prices come down, and labor has nothing to gain through keeping the value of the dollar at its present low level."

That means cooperation. We speeded up production during the war because we all pulled together. It is equally important now.

Don't "Carry" Accessories but Merchandise Them for Profit

BY M. E. FABER.

"Ugh! White man heap dam liar."

One of the party of hunters whom he was guiding had joshed old Spotted Horse about his aboriginal custom of sleeping on the bare ground, explaining that at home the paleface secured much comfort and pleasure from sleeping on feathers.

Spotted Horse had tried it. He was convinced that it didn't work. Hadn't he plucked a handful of feathers from a crow that someone had potted that day and carefully placed them beneath his blanket before retiring?

He certainly had been unable to perceive any such benefit as the white man had described. White men who did this were surely crazy. Never again. The bare ground for him hereafter, and no more trying the white man's fool ideas.

I know a garage man who says, "It don't pay me to carry accessories." He even refuses to listen to the jobbers' salesmen who try to show him the way to the profits he is missing.

This particular garage man puts all of his time in his repair shop and sells a car now and then when an easy prospect happens along. Once a salesman sold him his first stock of accessories. Most of that stock is still where he put it the day it arrived. It is dirtier, but otherwise it is the same.

Car owners go in and out of his garage every day without suspecting its presence because Mr. Garage Man doesn't take any pains to let them know about it and they are getting along well enough without some of the things they would want if they knew they were there.

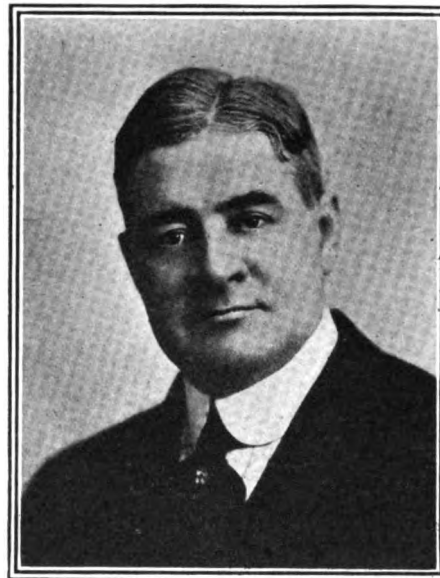
To look at his windows you'd think he was selling fliespecks and dirt. Why should anybody expect to find any-

thing useful in a place that doesn't give the appearance of believing in the salability of what it keeps for sale?

Accessories don't pay. "Salesman heap dam liar." He has tried keeping a stock of accessories and they keep.

Caywood Is Real Veteran of Air Compressor Field

Fifteen years has been spent by D. G. Caywood in selling air compressors to garage men and owners of service sta-



D. G. Caywood

tions. He was the first man to show the automobile accessory jobbers the profits that could be made selling air compressors. In the early days the jobbers regarded the air compressor only as a source of trouble, but Mr. Caywood has shown that the jobbers can sell air com-

If you don't believe in your business, get clear of it and find an opening into something in which you can put your whole heart and soul and spirit.

The average individual is just mediocre. There are countless reasons why this is so. We don't need to go into them, but it gives you and me all the better chance for success if we realize that stick-to-it-iveness, effort, initiative, concentration, and intelligent application of foundation principles will surely send us "Over the top!"

pressors at a profit both to themselves and their customers.

Until recently Mr. Caywood was sales manager for the Brunner Mfg. Co., of Utica, New York, but is now a special representative for the Black & Decker Mfg. Co., Baltimore, Md. His headquarters will be at the factory.

Selling and Advertising Firm Formed in Chicago

Formation of the Mead-Davis Company for the purpose of advertising and selling the entire output of factories manufacturing products allied to the automobile industry is announced. The new firm has offices at 814 Hearst Building, Chicago. The concern is headed by F. L. Mead, in charge of the department of sales, who February 1 resigned as general sales manager for the Dearborn Truck Co. Previous to this connection he was with General Motors Truck Co., Buick Automobile Co., Oakland Motor Car Co., and others.

The department of advertising is under the supervision of B. F. Davis, who has been identified with advertising for fifteen years. For the last two years he was advertising manager for the Dearborn Truck Co. The plan of operation of the Mead-Davis Company is to act in the capacity of directors of advertising and sales rather than as manufacturers' agents or distributors, as this enables them to work under the jurisdiction and in direct co-operation with the producer. Their function is to relieve the manufacturer of all sales details, thus enabling him to devote his entire time and attention to his product.

J. C. WALDEN AUTO COMPANY

FORDS, FORD PARTS AND ACCESSORIES.

Dothan, Ala., Feb. 15, 1919.

American Garage & Auto Dealer,
Chicago, Ill.

Gentlemen:

Enclosed find \$1.00 to cover subscription to the **AMERICAN GARAGE & AUTO DEALER**. We feel that this paper is well worth the \$1.00 per year.

Yours very truly,
J. C. WALDEN AUTO CO.

Plan of Machinery Arrangement in Repair Shop for Garage

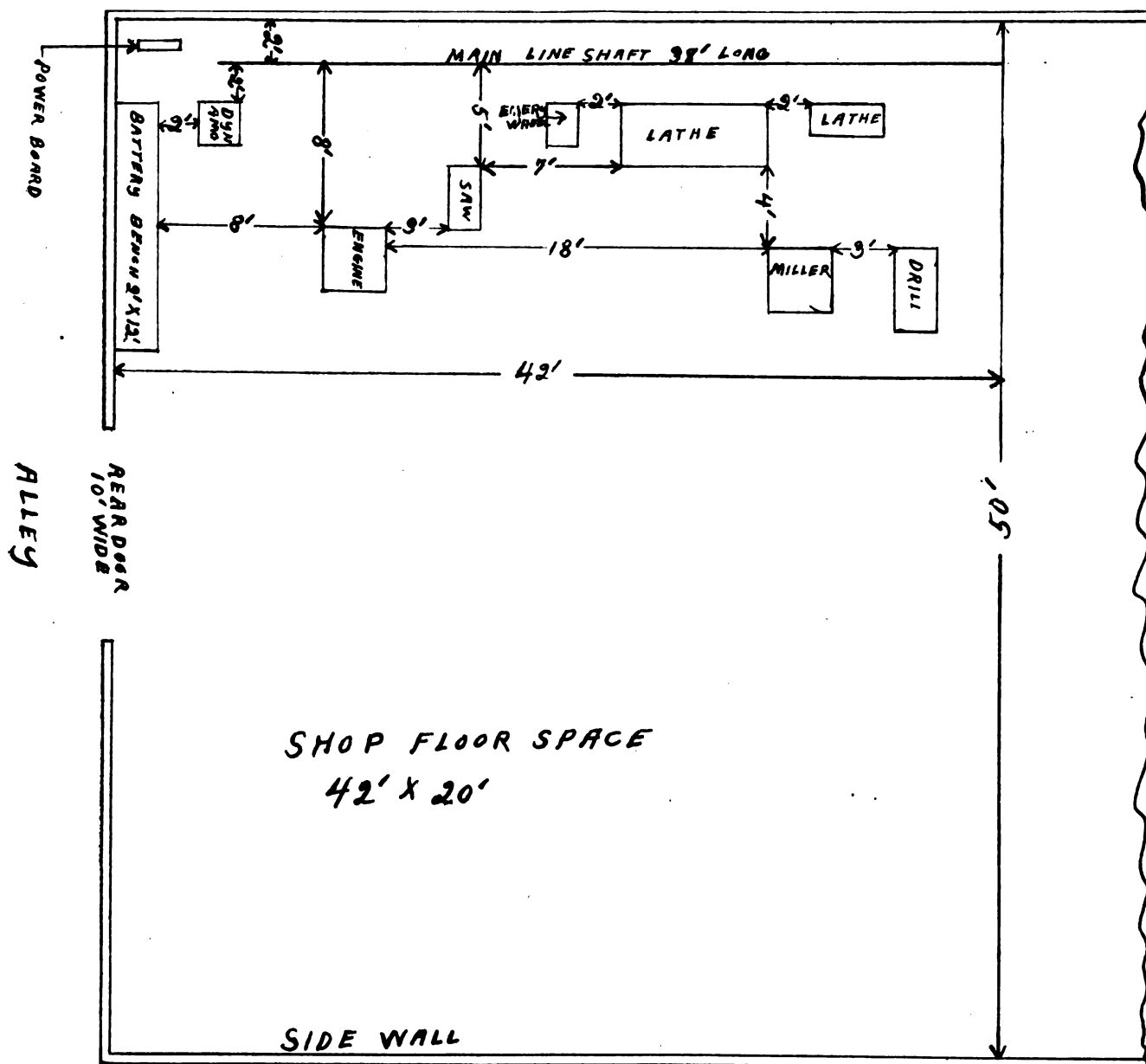
AMERICAN GARAGE & AUTO DEALER,

We are going to build a garage 50 feet by 120 feet, one story without basement, and would like to have a plan for the arrangement of machinery in the shop at the rear in a space about 20 feet by 50 feet. Also a practical place for power and electric plant and for charging batteries so the

fumes or gas will not be oppressive in the workshop. The dimensions are:

Lathe, 3 feet by 7 feet; small laths, 18 inches by 3½ feet; gear and slot cutter (miller), 30 inches by 30 inches; hack saw, 3 feet by 18 inches; drill, 4 feet by 2 feet; emery wheel, 2 feet by 18 inches; power engine, 3 feet by 3 feet; dynamo, 2 feet by 2 feet; air pump, 2 feet by 2 feet.

We do not know how much space to allow for the battery charging stand. We have our own electric plant and storage battery. The dynamo is 125 volts and the switch is only 32, and does not work right. It throws off and we want to know how to overcome this. There is an alley back of the building. A space will



E. B. H.

SCALE 1-IN = 8 FT.

have to be provided for an air tank.
AUTOMOTIVE DEALER.

BY E. B. HINRICHSEN.

It is rather difficult to lay out a shop satisfactorily with the information you give. It is necessary to assume the general location in regard to the building. From the dimensions you give as available for machinery space I assume you wish to locate at one side of the building. The sketch reproduced shows the machinery on the left side looking toward the front.

You do not say whether your power is to be derived from the gas engine or from a motor or motors run from your storage battery. I have shown the power taken from a line shaft driven by the engine. This line shaft is either on the ceiling or on the side wall, swung out 2 feet from the wall. The dynamo, hack saw and emery wheel drive direct from the shaft.

It will be necessary to install short line shafts for the lathes, miller and drill, but you will need these to get your speed changes.

As this equipment is laid out, it can all be put in a space of about 40 feet by 16 feet. It could even be put in a much smaller space if it was necessary, but this layout will give you ample room and will enable you to use all

machines at once and handle long lengths of stock without interference.

You did not speak of a power board, but I assume you have one. I have located this at the rear, readily accessible from the battery stand in order to get quick control changes if required. The battery bench is intended to include both the regular storage battery and those that are being charged for customers. This bench is shown as being 12 feet long by 2 feet wide, and can be built up in sections as high as you wish. This will be ample for the batteries your dynamo will carry.

Cover for Battery Stand.

There should be a steel cover over the entire battery stand with a chimney leading to the outside. You have no doubt seen the steel covers over big cooking ranges in restaurants. This will carry away all fumes.

As you do not give the make of your charging set it is hard to tell what is the matter with the switch. I assume it is of the circuit breaker type, as you say it throws out. You probably try to start your charge at too high or too low a rate.

After starting your engine and dynamo the voltage should be built up by use of the rheostat until the dy-

namo output equals or slightly exceeds that which the battery is supposed to furnish. The circuit breaker should then be thrown in and the current output raised by the rheostat until the desired charging rate shows on your ammeter on the power board.

Perhaps I am giving you directions impossible to follow on account of the outfit not having the necessary equipment. I can give you better directions after learning the make of the set.

Air Tank Near Roof.

I have not shown the air tank or pump in the sketch as you did not give the dimensions of the tank. In general, however, an excellent location for these is near the roof with the pump as close to the tank as possible.

This could be done in this case by locating them toward the front of the building, away from the rest of the machinery and driving the pump by belt from the main line shaft. Pipe from the tank to the parts of the building where you wish air taps.

You do not mention a heating plant or a gasoline tank. I suppose you have arranged to take care of these.

If the plan as laid out does not fit in with your ideas of location I would be glad to plan a new location upon receipt of more detailed information.

Victory Highways Advocated as Memorials to Valiant Troops

BY WINDSOR T. WHITE,
President, The White Company.

Traversing the Campagna di Roma, Italy, is the world's most historic highway. Time and foe have all but blotted out the grandeur of ancient Rome, but the Appian Way, in almost perfect condition, has withstood the ravages of twenty-two centuries. It stands today a monument to Roman road-building skill and an endorsement of the part played by good roads in enabling the Roman Empire for so long a time to subdue every would-be conqueror.

France is triumphant today because she has long recognized the military value of good roads. In winning the war, summed up by Lord Curzon as a "victory of Allied motors over German railroads," the highways of France were of vital importance. Verdun was saved, the great Somme defense made possible, the Chateau Thierry

victory achieved through the ability of French roads to carry steadfastly the mighty engines of Mars. And France plans to further her excellent system of highways by building a Sacred Way from Alsace to the North Sea, as a fitting monument to her valiant troops.

Investigators tell us that the economic and moral fiber of any community is determined by the condition of its highways. Not by its schools, nor its church spires, nor its banks, nor its factory chimneys, but by its roads! Give a community the right kind of roads and these other indications of advancement are sure to follow.

What more fitting monument, then, can we build in honor of our heroes than memorial roads? How can any state, county, or community better stabilize the achievements of its valiant sons than in a permanent road dedicated to them? And

all of these to be planned and built so as to form a great system of Victory Highways.

Victory Highways, that the lasting defense of America shall be made certain. Victory Highways, on which schools will be erected to teach our children the arts of peace. Victory Highways, over which food will move from farm to city and manufactured products back to the land.

We may study to obtain the most magnificent effects in stone and bronze and marble; we may plan to erect shafts to the very clouds; we may hope to dwarf anything that has been done in colossal architecture. But nowhere can we find a better way to appropriate the memorial offerings of a grateful nation than in the construction of permanent roads which in their completion will form a great system of Victory Highways.

Evolution of Transportation

The information contained in this article is taken from a booklet issued by S. A. Miles and F. W. Fenn of the National Motor Truck Committee, 7 East 42nd street, New York City. Any automotive merchant who is interested in the subject can obtain copies of the booklet and much additional data by writing to Mr. Miles or Mr. Fenn, asking for information about Rural Motor Express Lines.

Transportation is a human activity, which had its inception before our earliest recollections. Our knowledge of transportation dates back to the caravan of early Egypt—the donkey of Syria and Palestine and via the highways of Rome up to the dawn of Christianity.

Transportation has for its purpose the moving of something from one place to another—from the place where it is least needed to where it has a greater value.

The cheapest known transportation is that done by the coolie and on the backs of negroes carrying raw products from the interior of Africa to the coast.

In America the evolution of transportation has developed more rapidly than in any other portion of the world.

The pathfinder which carried the pioneer over the western plains and opened up a vast empire to cultivation was the ox team and the prairie schooner.

as a line of communication for a distance from it were it not for the fact that the product left at certain points can be carried to destination over transportation systems operating on steel rails and over the nation's highways.

The railroad, while it has opened up a vast empire, is limited in its capacity for serving. The engine can carry the train only where man has laid the rails. After years of experience in transportation by rail, there are many communities and vast areas that are today unserved by rail transportation. Large rural sections had to depend upon horse-drawn vehicles for their necessities and had to draw their own products over miles of poor country roads to the railroad, for like the river, the railroad could not go beyond its course.

All innovations are born out of necessity and out of this great world war the motor truck has come forth in a new light and the world is presented with a new utility—the Highway Motor Express.

As the war has progressed the burden had become too great for the railroad systems. Embargo followed embargo, and rates had been raised on freight and express shipments until industry faced ruin and humanity struggled under rising costs and diminishing food supplies.

Hence, it was only natural that an inventive race should turn to this most feasible form of transportation when con-

as rail-borne freight, even though it came up in a moment, and had not the advantages of years of experimentation which other forms of transportation have had.

Under certain conditions the truck of today is operating as efficiently and cheaply as the freight car and in almost every case it is more efficient and cheaper than shipment by express.

Dr. A. R. L. Dohme, head of the firm of Sharp & Dohme of Baltimore, has this to say, after using trucks from their first appearance:

"Since the early days the field of automobile trucks has also increased very materially. At first they were practically all of the heavy type for heavy hauling, but now when the Ford chassis has been converted into a station wagon, a light deliver wagon, a one-ton truck and many other uses too numerous to mention, the field seems to be completely covered and some sort of truck drawn by gasoline motor is available for replacing every form of horse-drawn conveyance, including, of course, farm implements of all kinds and descriptions. In fact, it has reached such a degree of perfection that it is today an essential feature of the warfare work on the other side, for without the motor-drawn trucks it would be impossible to conceive of the rapid movements that are today taking place on the field of battle. It would seem for this reason, as well as



There are today three main forms of transportation, as follows:

By water, by rail, by highway.

Transportation on the waterways has come up from antiquity, while on rail it first made its appearance in the early part of the nineteenth century.

The waterways run in the course laid down for them by Nature's laws. That course cannot be changed to suit the convenience of any man or society of men—it cannot be brought to your door. It flows onward, serving only those who live contiguous to its banks. It would be useless

fronted with disaster, and as the law of evolution had presented the motor truck, it was adopted to fill the need of the hour.

If we stop to think a moment, we find that the first automotive vehicle to make its appearance in the streets was only about 25 years ago, and that the advent of the motor truck dates back only twenty years. Its sudden development into a medium of long-distance hauling of anything and everything under the sun, over highways that have not developed as rapidly as it has, fairly astounds us. Some of us believe it should serve as cheaply

others, the automobile truck appeared on the scene at the psychological moment."

Although the service rendered by the highway express can now be considered efficient, as time goes on it will become more so, as ways and means are found to make for greater economy and better highways are developed. The following are some facts, obtained from tests on truck operation in northern Ohio, by one of the large tire manufacturers:

"Some interesting facts for students of motor truck transportation have been compiled by one of the large rubber compa-

nies of Akron, Ohio, showing the tonnage carried by railroads and trucks during the nine months up to July 1 over the forty-mile route between Akron and Cleveland. It shows that the large use of motor trucks has relieved the railroad traffic between those cities by 1,170 per cent over the nine preceding months.

"In car figures, this means that the forty-mile highway is giving 885 freight cars a week to other communities for more vital tonnage. If only an average of 600 car releases a week is maintained for twelve months this highway will have saved 31,200 freight cars for other uses.

"The tonnage carried in one week recently was as follows, by days:

| Motor Trucks. | B. & O. | Penn. | Erie. | Total R. R. | Grand Total. |
|---------------|---------|-------|-------|-------------|--------------|
| 426.5 | 183 | 320 | 33 | 536 | 962.5 |
| 441.0 | 460 | 179 | 40 | 679 | 1120.0 |
| 475.0 | 1847 | 121 | 67 | 2035 | 2510.0 |
| 549.5 | 318 | 110 | 75 | 503 | 1052.5 |
| 430.5 | 600 | 153 | 42 | 795 | 1225.5 |
| 747.5 | 332 | 70 | 20 | 422 | 1169.5 |
| 105.0 | ... | ... | ... | ... | 105.0 |

"The list gives a weekly total of 3,175 tons carried by motor trucks and 49,709 by railroads.

"The transfer of 3,175 tons of the Cleveland-Akron freight from the railroads to the highway represents only part of the relief. During the same period freight to the amount of 1,639 tons was carried over the highway to other points, 540 tons of this being routed from Cleveland to or beyond Kent and the remainder to or from Akron and points east."

Highway transportation, operating but a few months, over a single forty-mile stretch of highway, presents a spectacle of:

Relieving rail traffic 1,170 per cent over the nine preceding months.

Releasing 885 freight cars a week to other communities. Which if maintained for twelve months would have saved 31,000 freight cars for other uses.

This performance has demonstrated that:

1. The motor truck is solely a utility.
2. It discharges no function of entertainment.
3. Congested traffic constitutes a war problem, which it can and will solve.

The United States government has recognized the importance of the truck, both for military and so-called domestic uses. War department order No. 38 established the motor transport service for war trucks. The highways transport committee, serving as part of the National Council of Defense, was organized to divert all possible traffic to the highways. Government trucks running from cities in the Middle West to the seacoast are constantly establishing the practicability of overland delivery by power vehicles.

The department of agriculture has encouraged the application of trucks to the moving of food. Hon. Jas. I. Blakslee, fourth assistant postmaster-general, is hauling farm products into big cities distances of more than 100 miles by motor

trucks. His program, presented in a bill now before Congress, calls for the eventual establishment of 5,000 miles of new roads, which will be built from the profits of motor truck haulage of food to market. The National Motor Truck Committee is just in receipt of a letter from him as follows:

"Relative to the establishment of motor vehicle mail routes, under authority of Congress, there are now in operation fifteen motor vehicle mail routes extending from Portland, Me., via Hartford, Conn., and New York, Philadelphia, Baltimore and Washington, to The Plains, Va.; also routes from Columbia, S. C., Savannah, Ga., to Statesboro, Ga., and from Columbus, Ohio, to Zanesville, Ohio; from Indianapolis, Ind., to Cincinnati, Ohio, and from Indianapolis, Ind., to Louisville, Ky. These routes are mainly connecting or trunk line routes and those in the South and Middle West will ultimately be connected up with those in the East.

"These routes are laid out through producing territory to important market centers, and the purpose is to demonstrate the practicability, utility and value of this method of transportation in bringing the farmer into immediate touch with the consumer, by giving a direct, expeditious and reliable service at a reasonable cost for carriage, thus relieving other congested avenues of transportation and preventing wastage at the farm, thereby conserving other less perishable needed food products, encouraging increased production, and at the same time insuring a reliable market to the producer and giving the consumer the advantage of better and fresher products at less cost.

"It is intended ultimately to extend these trunk line routes to the Pacific Coast and connect with them feeder or lateral routes from contiguous producing territory.

"Owing to the limited amount of the appropriation it will hardly be possible to do more this fiscal year than connect up the routes in Ohio with those terminating at McConnellsburg, Pa., thus giving a through route to Portland, Me., to extend the service south from Louisville, Ky., possibly to New Orleans, La., and thence connecting up with the service in Georgia, and also connecting service with that now in operation southwest from Washington.

"On the fifteen routes now in operation there are employed sixty trucks of from one to one and one-half tons capacity, including reserve trucks, and fifty drivers. These routes cover 2,311.06 miles, involving a daily travel of 2,622.20 miles, or about 2,000,000 miles per annum.

"Some of these routes have been in operation sufficiently long to demonstrate not only their value and utility to the producer and to the consumer, but to demonstrate the fact that they are not only self-sustaining, but that they are large postal revenue producers.

"A tabulation of the postal receipts and

cost of operating eight of these routes from January 1, 1918, to May 31, 1918, a period of five months, shows gross postal receipts of \$152,237.74, with operating expenses of \$27,130.98, a net profit of \$125,066.40, an average of about \$3,000 per route per month.

"The service which it is proposed to give to patrons is similar to that afforded by commercial express trucks, within the limit of weight prescribed by law, that is to say, 70 pounds for a distance 300 miles of the point of mailing and 50 pounds beyond 300 miles, and commodities such as eggs in crates, butter, crates or baskets of fruit will be accepted if presented prepared just as they usually are for shipment by express, and where a shipment warrants it, they will be delivered direct from the consignor to the consignee."

Motor truck mail service showing a surplus of \$200,000 for the first six months of operation warrants immediate legislation for road construction that will extend the service throughout the country. The United States Senate has tentatively appropriated the sum of \$100,000 for the purpose of transporting food products from agricultural districts to cities, to experiment in the establishment of hauling foodstuffs over postal routes.

Every truck put into service brings the farmer nearer the consumer, supplies the equivalent of man-power lost by withdrawal of soldiers, and makes less serious the shortage of horses.

The farmer, dependent as much on rapid access to his market as on the productivity of his farm, finds the motor truck coming to his aid at a time when he cannot hire farm hands. A truck on a farm will replace from two to four men. It will carry twice the load in half the time. It will make available for other production five acres of land whose yearly crop is now required to feed a horse.

It has been estimated that in view of the greatly increased production of foodstuffs, wheat, rye, barley, oats, corn, beef, pork, mutton, eggs, milk, poultry, and fruit, that 2,000,000 trucks could profitably be used between farms and markets. Only 450,000 motor trucks are now available for all lines of business. This is only 22½ per cent of what could be applied to farms alone.

The use of the truck in rural motor express lines offers the best possible medium through which farmers, truck growers and dairymen may get to their markets.

Motor trucks delivered over 1,300 carloads of hogs to the Omaha market during the first six months of 1918. The total was 92,708 hogs, an increase of 180 per cent in comparison to 33,084 delivered during the corresponding months the year before. The business is growing and increasing daily every day owing to the relief in transportation gained by the use of the motor vehicle. Experience has shown that marketing by truck is just as

feasible during the winter months as it is in summer, as more than 26,000 hogs were delivered directly from the farms to the Omaha market during the months of January and February.

An increase of 180 per cent in the number of hogs transported to market by motor trucks in one year has brought matters to the point where the motor truck business has become so important to the West that commercial organizations in Omaha are taking active measures to utilize the trucks on return trips to country points for hauling various kinds of freight. Railroad transportation is being relieved of part of a great burden in this manner, as it is in the eastern states. How the highways leading to Cincinnati came to be very widely used for motor truck hauling of livestock to the stockyards of that city last year was recently related by the *Manufacturers' Record*. That publication said in part:

"This method of transportation is comparatively new and grew out of railway

lines of trucks moved slowly to the unloading platform from midnight to long after the break of day. Similar work is being done at other points, especially Kansas City, Mo.

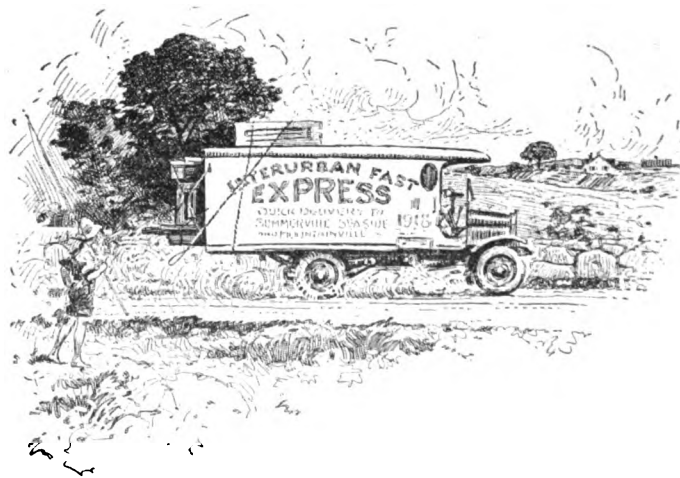
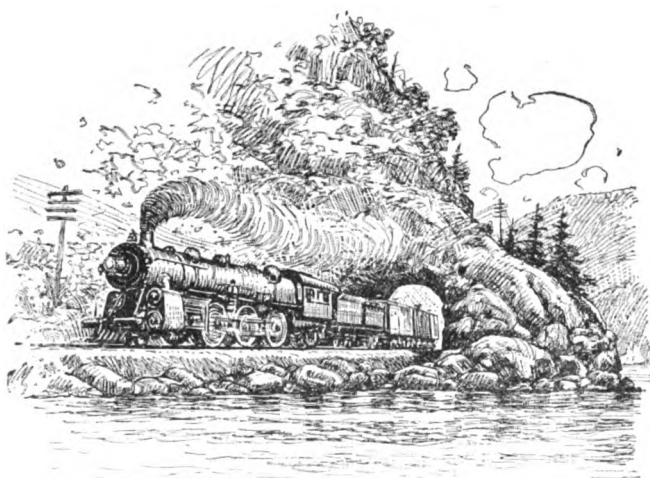
The National Motor Truck Committee, with headquarters at 7 East Forty-second street, New York City, and 509 Seventh street, N. W., Washington, reports the following progress:

At Mason City, Iowa, lines over the highways were laid out, and trucks were operated over them by one of the leading manufacturers of motor trucks. These tests demonstrated the motor truck as an economical method of hauling foodstuffs, and resulted in the formation of a company, with a capitalization of \$50,000. This company will use ten or twelve trucks and will operate over five routes, varying from 90 to 150 miles in length. These people believe that as time goes on they will have to have additional trucks, and, hence, additional capital.

Governor Harding of Iowa has become

In and around St. Louis, Mo., several lines of rural motor express have been established, notable among them being between that city and the following cities and towns in Illinois: Alton, Collinsville, Belleville, East St. Louis, Granite City, Madison and Edwardsville, and to St. Charles, Mo., while there is in process of formation other lines to points 40 to 50 miles west of St. Louis.

C. W. Munson, president Elderfields Reservation, at Flower Hill via Plandome, Nassau County, New York, writes: "I would be very glad to discuss the opportunity which our organization may have to increase our helpfulness in war work along the lines of motor express. Our tractors and trailers are now employed in gathering crops from the farmers in conjunction with our farm tractors and its auxiliary labor-saving machinery. We are attempting to market all that is possible in our county limits, including the army encampment at Camp Mills. A large proportion of the purchases are sent to New



congestion which compelled farmers to find other ways of reaching market. During the year there were hauled over highways from a radius of thirty miles 77,244 hogs, 23,618 sheep, and 28,545 calves, with 27,721 head of cattle, about 40 per cent of which were driven in on the hoof and the rest hauled in motor trucks. The driving of cattle to market has not been found profitable, as they cannot be driven any distance in cold weather, while in hot weather the trip causes overheating, deterioration of flesh, and a slow market with the packers. Cattle are being brought in in specially constructed auto trucks, and hogs and sheep are hauled in double-decked motor trucks. With good roads around Cincinnati it is reported that such transportation promises to be permanent, the stock being hauled cheaper than by railway, arriving in better condition and in quicker time."

At the Union Stock Yards at Indianapolis 574 motor trucks were counted in one day, hauling livestock, cattle, hogs and sheep, from the farms, each carrying from 1,500 to 2,000 pounds of stock. Long

deeply interested in rural motor express lines. He has been particularly interested in the methods employed by J. D. Eggleston at Mason City. He called Mr. Eggleston before a meeting of the State Council of Defense, and he was asked to give a like service to every other part of the state, with the result that lines will soon be in operation from Sioux City, Cherokee, Carroll, Atlantic, Fort Dodge, Des Moines, Marshalltown, Ottumwa, Davenport, Dubuque, Cedar Rapids, Waterloo and Council Bluffs. At the present time there are 155 trucks running out of Council Bluffs, and during the past two months 175,000 head of hogs have been hauled over this route.

One rural motor express route running out of Austin, Iowa, started with one truck on August 1. Since that time another has been added and a third will be running within a few days. Within a short time rural motor express lines will reach every point in the state of Iowa, as plans are now being developed by the motor truck transportation committee with this end in view.

York and except for a small proportion these trucks come back empty."

Mayor Asa G. Candler of Atlanta writes that he will co-operate to the fullest extent in the furtherance of this most important work, and we may expect developments from that source.

Frank Birrer of Poughkeepsie, N. Y., is starting a service from that city to New York, carrying farm produce and fruits. He will start with one Packard four-ton truck, and add others as they are required. He will run to New York on Monday, Wednesday and Friday, and on alternate days return to Poughkeepsie. He will take in all the towns en route, and has a regular schedule of rates to all points. He will have his truck covered with electric lights and large display posters.

A rural motor express route has just been started between Portland and Bath, Me., by Joseph Coty, Freeport, Me.; who will carry farm produce to the Portland market.

Activities in Chattanooga, Tenn., take in the following: A line of rural express has been formed taking in the cities along

Install a Curtis

Air Compressor



The Curtis Sign

Illustrated above—is 10x14 inches—baked enamel on steel. Cannot be bought, but is furnished FREE with every CURTIS Garage Air Compressor—and cannot be had in any other way.

Display a CURTIS "FREE AIR" SIGN above your door—it inspires confidence and will help build your business. Motorists are looking for this familiar CURTIS slogan—because they know oil rots tires—and that a CURTIS Air Compressor furnishes AIR FREE FROM OIL, which means fewer blowouts, greater tire mileage and less repairs. The CURTIS is the ONLY Garage Air Compressor with the controlled splash oiling system that eliminates all danger of forcing oil into the air line.

CURTIS AIR FREE FROM OIL

Investigate the many exclusive features of CURTIS Garage Air Compressors. The line is complete—five sizes—stationary or portable. Just write your name and address on the margin of this advertisement—tear it out and send it to your jobber, or to us direct, for complete information and prices.

Curtis Pneumatic Machinery Co.

1515 Kienlen Ave., St. Louis, Mo.

Branch Office—530-U Hudson Terminal, New York City



TIP-TOP OF AKRON TI-RE-PAIR OUTFIT

The Best Equipment

It pays to buy the best equipment if starting in the tire repair business or adding to present equipment. Tip-Top Tire-Re-Pair Equipment is regarded by tire manufacturers, tire repair schools and repair shops as representing the highest standard of quality in tire repairing equipment that it is possible to produce.

TIRE RETREADING

The high price of tires has created a big interest in tire retreading. Motorists who have worn down their tires until no longer usable want new treads put on.

Every tire repair shop should have one of these recently developed Type E Cavity Retreading Outfits, which operates on the same principle as the regular cavity vulcanizer used for repairing casing punctures and blowouts.

Cost of outfit with self-contained steam boiler is much less than that of a vulcanizing kettle and separate steam boiler. (The use of large and expensive retreading kettle outfits is no longer necessary since the development of this type of retreading equipment—and the elaborate, difficult and time-consuming system of wrapping tire is not required with the cavity method.) Outfit is very compact and takes up little room in the shop.



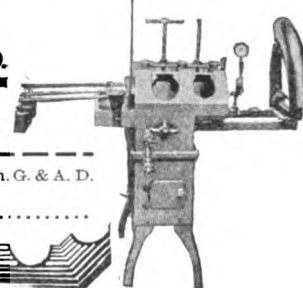
Motorists who have never bothered with tire repairing are now having casing and inner tube punctures and blowouts repaired by the vulcanizing process.

TIRE REPAIRING

Now is the timely time to start in the tire repair business.

We make a complete line of Tire Repairing Equipment—cavity vulcanizers of both the self-contained boiler and separate boiler types—Tube Plates—Steam Boilers—Bead Molds—Tire Repair Tools. No matter what you have need of we are in position to supply it to best advantage.

Write us today for literature describing our full line of tire repair equipment and data regarding vulcanizing and the possibilities for profit in the tire repair business.



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Am. G. & A. D.

Name Address.....

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

the way to Atlanta, Ga. They will carry manufactured products one way, and bring back foodstuffs on the return trip. As an aid to rural express they have organized a marketing committee for disposing of the farm products; a school for training chauffeurs for rural express and war work (this school started with a membership of 150) and a bureau of efficiency for motor truck operation.

Out of Buffalo, N. Y., comes the report: "There is one line of rural express operating between Buffalo and Springville, N. Y., a distance of 30 miles, which has been in operation about three months. It is reported that they carry the farmer's products into the city and returning carry back to the farmer goods that he needs. He has regular tariff rates covering all commodities."

There is a line of rural motor express operating from Adrian, Mich., to Detroit, which is carrying a varied cargo, ranging from butter to calves and castings.

There is a line of several trucks carrying milk from the farmers to Ravenna, Ohio, while others are doing a like service for Mansfield, Ohio. There are also two lines hauling milk and cream from the farms into Newton, Kan.

Rural motor express lines are hauling farm produce, grain, cotton and tobacco, into Newbern, N. C., for shipment to northern markets.

Down in Terrell, Tex., they are operating a rural express line from that point into Fort Worth via Dallas. Four trucks are operated over a distance of approximately 75 miles.

In Colorado rural motor express lines are being organized, and some of them are in operation. One line is in operation between Denver and Pueblo, and another from Denver to Fort Collins, covering intermediate points. Another line is being started from Canon City to the Cripple Creek district, thence to Colorado Springs and Pueblo, while still another line is about to start operating between Denver and Fort Collins.

From Kalispell, Mont., comes the report: "Even in this remote part of our Union we are developing the very conditions which you seek to establish throughout the country; although in a small way, and our country boulevards are relieving the situation. Motor passenger trucks as well as rural express are competing with the Great Northern Railroad to points roundabout Kalispell."

A rural motor express line called the Overland Express is now in operation between Austin, Minn., and Blooming Prairie, Minn. On its first trip it carried 3,940 pounds of foodstuffs. They report that "this was the first of what will be known as Overland Express, which will probably be instituted by wholesalers and manufacturers of this city to carry goods to other places and bring back the produce of the farms to the city."

Do not forget that this progress has developed within a few months and that these are only a few of the results obtained. What will two years of concentrated effort do?

A plan of organization, known as form No. 2—"Organization of a Rural Motor Express Line," has been prepared by the National Motor Truck Committee, which may be procured on application to that committee at 7 East Forty-second street, New York City.

The highways are the natural lines of communication between the rural districts and the centers of population. The wealth of our soil can be brought over them with dispatch, insuring ample food supplies at all times.

With the extension of rural motor express lines will come better and safer highways.

The highways are the arteries through which flow our commerce, the life blood of the nation. They should be built strong enough to carry that commerce, and in times of war serve as military highways, that that commerce may never for a moment cease, but flow on uninterruptedly, supplying the nourishment necessary to the sustenance of life, to the victory of our arms and the glory of our flag.

U. S. Bureau of Markets Wants Rural Motor Lines

The Bureau of Markets of the United States Department of Agriculture has announced its readiness to enter into co-operative agreement with operators of rural motor-truck routes who desire to work more closely with the Government in developing, stabilizing and standardiz-

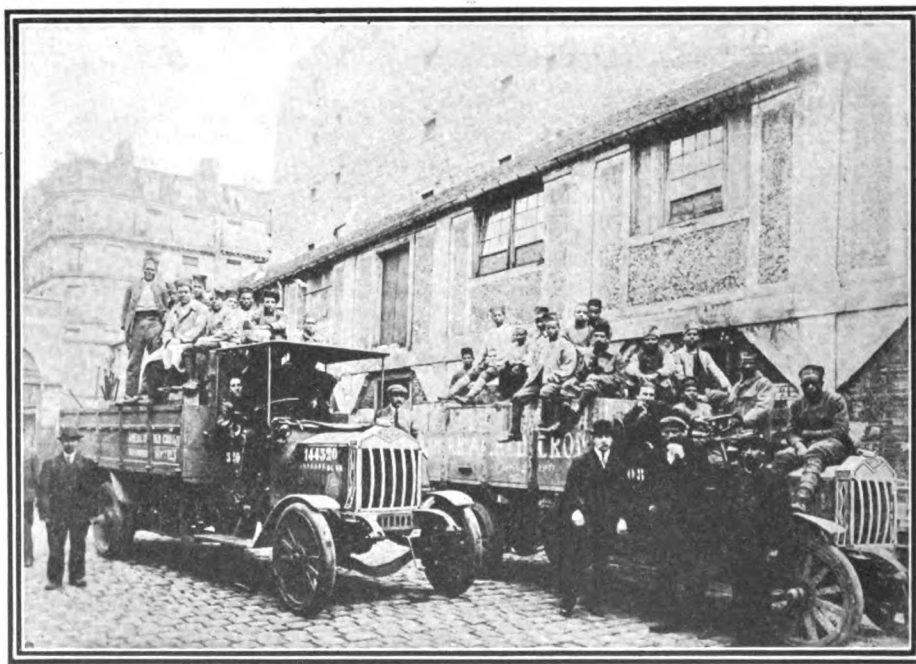
ing this business. Operators who agree to work according to most approved practices, and to conform to the general requirements of the Bureau of Markets are to be given the advantage of receipt of advice and information developed through the bureau investigations.

Large metal signs for display on trucks will be furnished to operators meeting the requirements. These signs will read, "The Owner of This Truck Is Co-operating with the Bureau of Markets, United States Department of Agriculture." The operator also will be privileged to use this sentence on his stationery and in advertising.

Requests for application blanks, to be used in obtaining the signs, should be made to the Chief of the Bureau of Markets, United States Department of Agriculture, Washington, D. C.

Through its co-operation with motor-truck operators the Bureau of Markets hopes to make it easy to place in proper hands such advice and information as it may obtain; to act as a medium for distribution of information among operators; to stabilize the rural motor business by requiring adherence to certain business practices, and to give to reliable operators the business advantage of working co-operatively with the Bureau of Markets.

Truck operators who desire to co-operate with the bureau must agree to maintain dependable service and schedule; charge just rates based on cost plus a reasonable profit; keep satisfactory records of operating costs and furnish certain of them to the bureau; use uniform bills of lading approved by the bureau, and provide adequate insurance for shipments.



Clydesdale motor trucks, in service of American Red Cross in France, which went through the Battle of the Marne. The original photograph was given to F. C. Henderson, Boston distributor of the Clydesdale trucks, by a French officer who remembered he had the picture when he passed the Henderson showroom.

REBOUND CHECK **BURGESS** SHOCK ABSORBER

RUBBER SPRING CAP

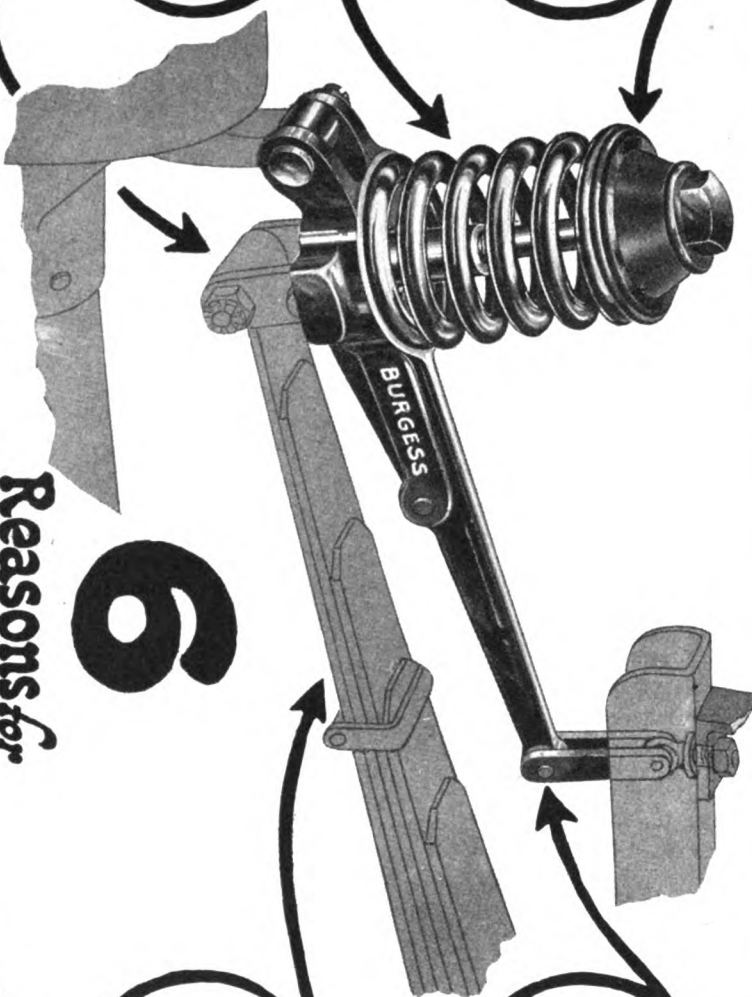
The greatest improvement ever made in a shock absorber, absorbs vibrations faster than they can possibly occur, breaks metal to metal connection between the car body and axle and quiets the entire car.

THIS BIG COIL SPRING

So designed that every coil does its share, takes up all the light road shocks and decreases the action of the leaf spring, thus reducing the rebound.

FRICTIONLESS ACTION

Leaf springs are shackled to the free acting suspension post without guide ways or other friction and wear producing mechanism.



END OF REBOUND and SIDE SWAY

The rebound is instantly controlled by the down pull of the spring arm on the body. The angle and action of the shackle prevents side sway.

NO LOAD OR STRAIN

is placed on the leaf spring where it can in any way bend or damage the spring.

WEAR PROOF BEARINGS

All bearings are friction proof bushings on hardened steel pins, a construction adopted by leading automobile manufacturers.

Reasons for **BURGESS** Supremacy

Write for Full Particulars
Manufacturers
Walter S. Burgess
Manufacturing Co.
Sales Dept.
The Zinke Company
 1323 S. Michigan Ave.
 CHICAGO



BY M. E. FABER.

I have noticed that in a great many garages, where the space for the display of merchandise is naturally limited, the stock of tires is allowed to take up too much room that might more profitably be devoted to accessories. I do not mean that the stock of tires is not a highly important one or one which should not be featured, because there is always a demand for tires that the garage man should be prepared to take care of.

Tires take up a whole lot of room, however, and it is very probable that a display of a few styles, just enough

to show that a representative stock is carried, would answer all purposes of informing the public as well as to have the entire stock in the accessory department.

A tire is something that you can't sell to a man who has plenty. When he needs a new tire he is going to buy it in spite of you. He doesn't need to be educated to the use of a tire as is the case with many profitable accessories.

So if your tire stock is occupying space that could otherwise be used for displaying accessories to such an extent that the accessories are crowded

for room, try to remedy the condition by finding a place out of sight for most of the tires and give the accessories a chance to sell themselves.

One dealer has solved the problem by building a rack that is accessible for tires at the back, and which has on the front a glass case for other merchandise. A few tires are shown on the top of the case and the accessory display is as good as the display of goods in the average store. His tire sales haven't been harmed and the sales of accessories have grown in proportion to the increased display that they receive.

Firms All Over the World Use Lourie Tire Applying Presses

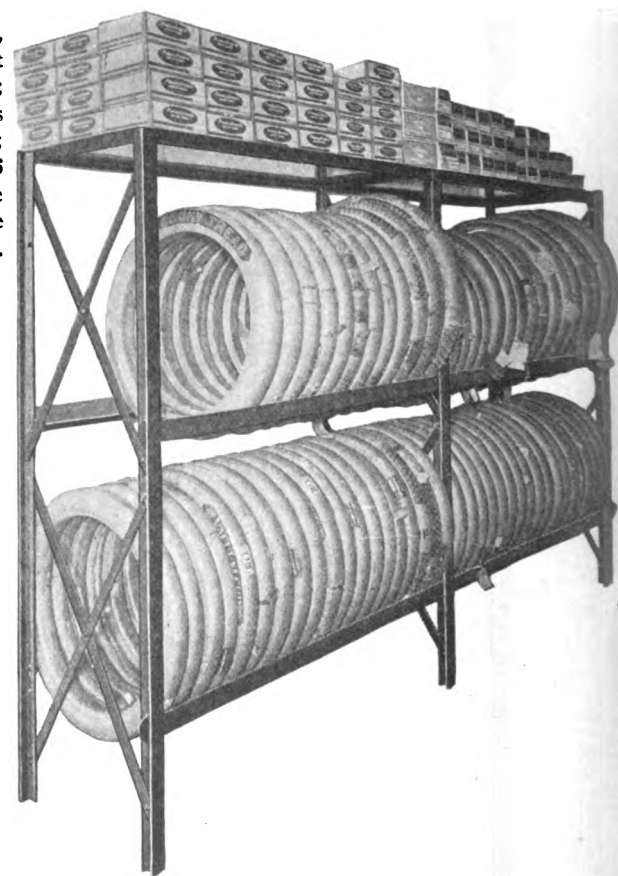
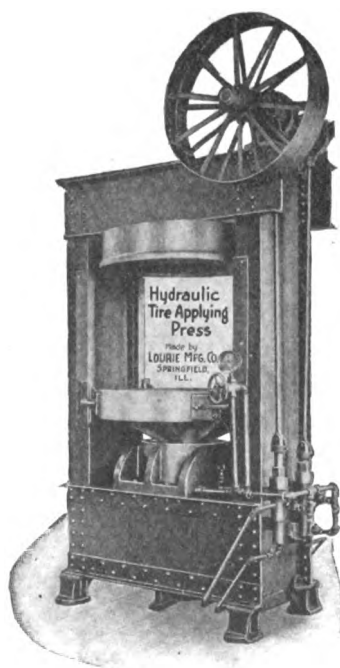
The Lourie tire applying press is used not only by a great many tire merchants, garage men and service station owners, but also by a number of branches of tire manufacturing concerns. Among these big tire manufacturers that use the Lourie press are the Firestone, Goodyear, and Swinehart concerns. From its factory at Springfield, Illinois, the Lourie Mfg. Co. makes shipments to all parts of the world, and the Lourie folks say that "the sun never sets on Lourie presses."

The Lourie hydraulic tire applying presses are made in 4 sizes: 150 ton, 200 ton, 250 ton, and 300 ton. A 4-horsepower motor or its equivalent supplies power for them. Some of the special advantages claimed for them include hot riveted structural steel frames, semi-steel cylinders, rams and platens; differential pumps with automatic regulation to give fast movement of ram; long guides and angle steel guideways to give an accurate movement of ram; light weight Medart patented wrote rim pulleys, and up push ram which returns quickly into the cylinder by its own weight so there is no leakage of oil.

The dimensions of the 200-ton press are as follows:

Distance between I beam posts, 46 inches; height of frame, 106 inches, total height over all 11 ft.; width of frame 58 inches, total width over all, 5

feet, 9 inches; depth of frame 28 inches, total depth over all, 2 ft. 10 inches; height of lower platen from floor, 4 ft. 3 inches; distance required between platens, 32 inches which can be made greater if desired; floor space required, about 4 feet by 6 feet. The four sizes of presses have the same diameter platens and same distance between platens, unless ordered changed.



Tire rack with two tiers for tires. The shelf on top protects the tires from dust and may be used as a storage place for tubes in boxes. Made by H. H. Shultz Co., Inc. Gowanda, N. Y.

Better than ELBOW Grease for Cleaning and Polishing Your Car



Water ruins finish. Waxit benefits it. Cars that are continually washed soon become checked. The finish gets dimmer and duller. Cars that are cleaned and polished with Waxit hold their new appearance. The finish stays *live* and *elastic*.

Waxit

"The Perfect Polish"

is cleaner and polish combined. Moisten a cheese cloth with it. Rub lightly over the surface of the finish. Off comes grease, dirt and streaks—back comes brilliancy of finish. Without hard rubbing and in a jiffy it is shining like a mirror. Waxit gives a hard-dry finish. Far superior to a dust-gathering film of oil.

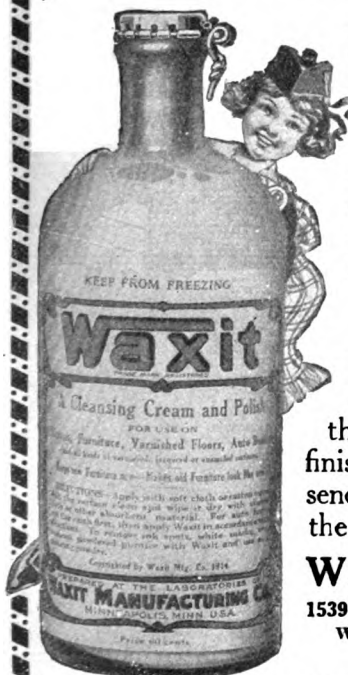
The owners of the finest cars instruct their chauffeurs to use nothing but Waxit. It is the very same polish that the housewife uses on her mahogany piano and fine furniture. The finest thing of its kind on the market.

The Sales of Waxit Are Growing Fast

because Waxit has the quality in it that **MAKES IT SELL**. It does a better and quicker job of cleaning and polishing than any other preparation. It is beneficial to the finest finish. **WRITE** for full sized package—we'll gladly send it gratis—and our dealers' proposition. Mail the coupon.

Waxit Manufacturing Company

1539 Old Colony Bldg. Chicago, Ill.
Walkerville Hardware Co., Ltd., Walkerville, Ont.
Eastern Canadian Distributors



WAXIT MFG. CO., 1539 Old Colony Bldg., Chicago.
Kindly send me full sized bottle of Waxit and your proposition to dealers. My dealer's name is

Name
Address
City State

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Make Windows Earn Dividends

All automotive dealers should utilize to the fullest extent the merchandising possibilities of their windows. Even those tradesmen who sell only passenger cars or trucks or trailers or truck-making attachments can make their windows earn dividends for them by displaying their wares attractively so that possible buyers passing their establishments will realize that the dealer has something he is proud to exhibit.

When the dealer sells tires and accessories—and every one should—he has an especially good chance to make

Most manufacturers and jobbers of accessories will be only too willing to help dealers with suggestions as to the most approved methods of arranging window displays, without any charge to the automotive merchant.

There are some excellent suggestions in the descriptions of the three window displays given below, which were prepared for its branches by one of the big tire concerns.

'Description of branch window display on misalignment of wheels, No. 6520.

First, procure from one of your dealers or from your own scrap heap, a worn-out tire showing the evil effects of allowing the wheels to get out of alignment.

Use floor covering now in your window.

Arrange the worn-out tire, two new tires, inside tire protectors as illustrated.

Mount the advertisement on one piece of cardboard

and the conservation bulletins on another piece of cardboard. Set up these two pieces of cardboard and the special card as shown.

Set the background and palms in place and the display is completed.

We are sending the advertisement, conservation bulletins and special advertisement under separate cover.

Description of branch "Back on the Market" window display, No. 6551.

The only special material necessary for this display is an enlargement of an adver-

tisement appearing February 1, entitled "Back On the Market." We are sending you special window display copies of this enlargement under separate cover.

Procedure.

Use the floor covering now in your window.

Mount the enlargement on cardboard or a wooden frame and set it up in the center of the window.

Group cord tires on each side and arrange the tubes and tube boxes as illustrated.

Set the palm trees and background in place and the display is finished.

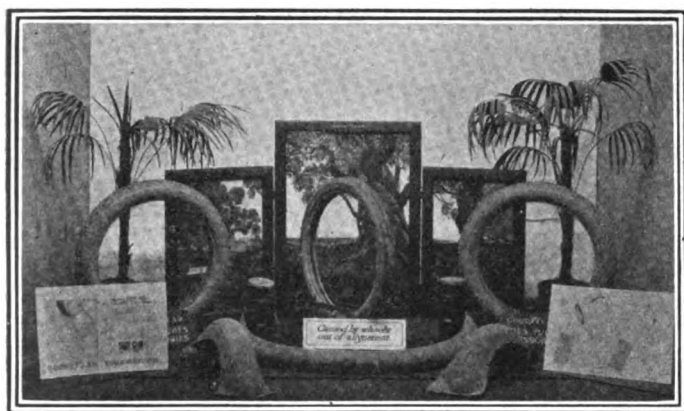
Description of branch window display, "Both Are Our Tubes," No. 6577.

We are sending your branch in a separate package enlargements of the "Both Are Our Tubes" advertisement, for use in this display. Mount them on cardboard, or, better yet, on a wooden frame.

Cover the floor with orange crepe paper.

Set the enlargement in the center of the window and group tubes on each side as illustrated.

Place the palms in position.



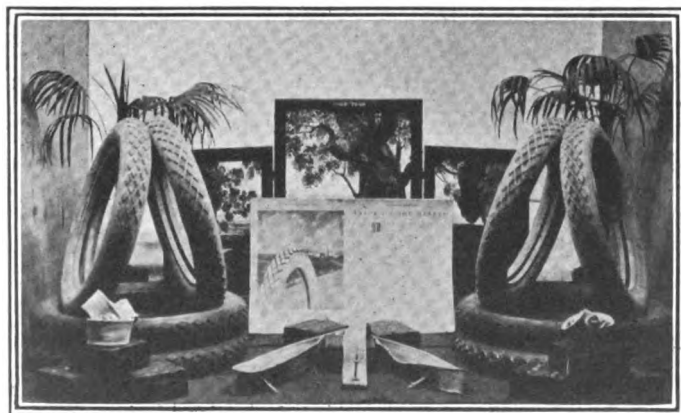
Window Display No. 6520.

profits from sales made to buyers brought into his store by seeing well dressed windows. The best plan to follow, and the one which has proved most profitable to big firms that have made careful study of the subject, is to exhibit only a few different articles at a time.

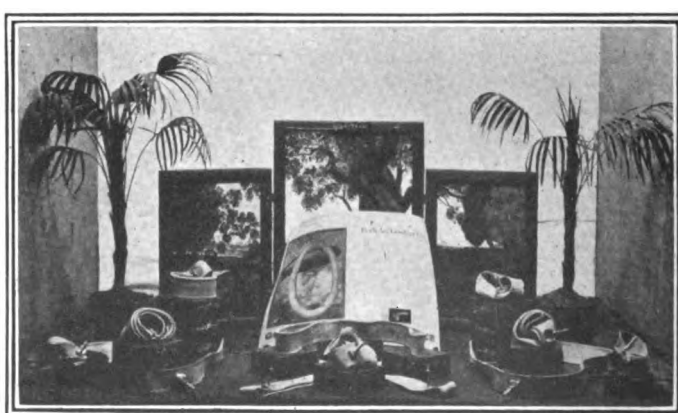
If the displays are changed frequently they will bring in more profits than if left in a window too long.

\$5 for an Attractive Window Display

If you will send us a picture of your window display, together with a description and a report of the results, we will gladly award \$5 to you for photographs accepted for publication.



Window Display No. 6551.



Window Display No. 6577.

Marked Changes in the Air Compressor Situation

Tire Inflating Machinery Now Faces the Severest Demands Ever Known



Much Equipment Formerly Considered Satisfactory Now Entirely Inadequate

A FEW years ago, to have predicted the use of 10 and 12 inch tires, carrying pressures upward to 140 pounds would have meant to be branded a "dreamer."

In the last two years, however, due to conditions brought about by the war, these tires have come into quite common use. The experimental stages were long since passed, and these tires are now recognized as absolutely essential to most efficient operation.

With tire pressures jumping from 80 and 90 pounds to 130 and 140 pounds, a new difficulty was encountered. To satisfactorily inflate such tires requires a tank pressure of from 175 to 200, and it was obviously unfair to expect the average compressor to measure up to these unusual requirements—only an eminently superior machine would adequately meet the need.

The government, in prosecution of the war, keenly felt this need and after trying several machines and suffering a loss of several thousands of dollars through under inflation, they made every possible effort to overcome the difficulty.

Their search ended when the Usaco Two Stage De Luxe Automatic Air Unit was tested and after finding it exactly suited to the needs a large number was ordered for use here and abroad.

The United States Air Compressor Co.
6542 Carnegie Ave.
CLEVELAND - OHIO

The Usaco Line comprises 20 different numbers in Two Stage and Single Stage Types, with capacities ranging from 1½ to 21 cubic feet per minute and pressures up to 500 pounds.

This experience proved the truth of the claims made by this company—that the De Luxe Compressor was **distinctly in a class by itself.**

The
Usaco Two-Stage
DE - LUXE
Automatic
Air Unit

The De Luxe exactly meets the needs of a majority of establishments. It maintains high pressure in great volume, is extremely quiet in operation, handsome in appearance, entirely automatic in operation and requires only a minimum of attention to keep in perfect running order.

To purchase a De Luxe compressor means to be equipped for the most severe need existing today or likely to develop for years to come.

Complete description of this unusual compressor is given in our literature. Write for it today.

Send Coupon For Complete Data

Send literature regarding DE LUXE COMPRESSOR as advertised in American Garage and Auto Dealer to address in margin.

In the Truck and Trailer Field

Educate the farmer in the real use of the motor truck and in the financial returns to be had by changing from horses to trucks, and all the motor



W. F. Melhuish, Jr.

truck makers in America will never be able to fill demands of farming communities, let alone the needs of the cities. This is the belief of President W. F. Melhuish, Jr., of the Fulton Motor Truck Co., who declares every truck

made could be sold to farmers. He points to the testimony given at the

recent Fulton convention by H. D. Hart of Thorofare, N. J., who disposed of 57 Fulton trucks in six months in the country districts of two New Jersey counties.

"Mr. Hart came to the convention unheralded and unsung," says Mr. Melhuish. "True we had been shipping a lot of trucks to him but who ever heard of Thorofare, N. J.? Somehow his orders coming singly and in pairs mounted up, but more important distributors claimed our attention. And, strange to say, the big distributors with whom we spent much time did not do as well, when we came to look it up, as did H. D. Hart, whose territory included no large cities in Gloucester and Camden counties. He did not have the city of Camden to work in.

"Mr. Hart came to the Fulton convention at Farmingdale, Long Island,

and was overheard telling his story to another dealer. In telling his experience he said that what was necessary in the truck business was to go to the farmer and show him. He did this and as one farmer adopted the more modern method of transportation by putting his Fulton into operation, others saw the benefits accruing to their neighbor and looked into the matter themselves.

"The other farmers visited Mr. Hart at Thorofare and were won over. His trade grew until today he is ready to guarantee the sale of 100 or more trucks in his territory, because all he has sold have made good and he has provided good service. His example can be followed by others without doubt and there are 7,000,000 farmers in this country, of whom only a small proportion own motor trucks."

Trailer Men Re-organize; Plan Aggressive Campaign

Reorganization of the body was effected at a meeting of the members of the Trailer Manufacturers' Association in Cincinnati February 20. Representatives of twelve of the largest producers of trailers were present at the gathering. Plans were made to inaugurate an aggressive campaign to further the use of trailers and the interest of both prospective users and sales agents will be aroused. Some of the subjects discussed included advertising, publicity, sales policies, financing, freight classifications, standardization, legislation and good roads.

It was agreed that the objects of the association are to encourage the introduction and use of trailers, to further the construction of good roads, to aid in the enactment of suitable traffic laws, to obtain and distribute information for the use and benefit of its members, and to do everything suitable toward the advancement of the trailer industry and of trailer dealers.

Officers were elected as follows: President, W. E. Ferris, Ohio Trailer Co.; first vice-president, W. A. Murfey, King Trailer Co.; second vice-president, R. C. Sykes, Troy Wagons Works Co.; secretary-treasurer, J. C. Endebrook, Trailmobile Co. Additional members of executive committee: W. R. Bond, Detroit Trailer Co.; W. F. Jolley, Miami Trailer Co., and Charles H. Martin, Martin Rocking Fifth Wheel Co.

Highway Coal Delivery Plan of Fuel Official

The United States Fuel Administration, through Cyrus Garnsey, Jr., assistant fuel administrator, is endorsing the most extensive and efficient use possible of the highways, to the end that the transportation resources of the country be increased, has transmitted to the Highways Transport Committee, Council of National Defense, to which body is delegated all matters dealing with any phase of highways transport, a letter emphasizing the applicability of the Committee's program to the problems involved in the expeditious and larger tonnage movement of coal from wagon mines.

Mr. Garnsey's letter, addressed to R. C. Hargreaves, secretary of the Highways Transport Committee, expressing the Fuel Administration's approval of the steps being undertaken by the highways transport body looking to the most effective utilization of highways transportation, continues:

"We are also convinced that transportation resources can be greatly increased and larger tonnage movement of coal from wagon mines direct to consumers effected by applying all possible vehicles, horses and the necessary labor in line with national policies promulgated by you, and operating over suitable highways constantly maintained in efficient condition.

"For this reason we ask that you convey to your field organization our very real interest in this part of their work and assure them we desire to support their organization to the limit in their efforts to effect greater tonnage movement of coal over the highways from wagon mines to consumer.

"We suggest also that whenever conditions of roads, local legislation, lack of suitable equipment, and so forth, tend to impede the most effective and efficient movements, you will promptly bring these matters to our attention.

"To expedite the handling of these questions the Fuel Administration has committed them to its Mine Track Committee, composed of Frank G. Jones, chairman; Robert L. Ireland, and S. A. Taylor."

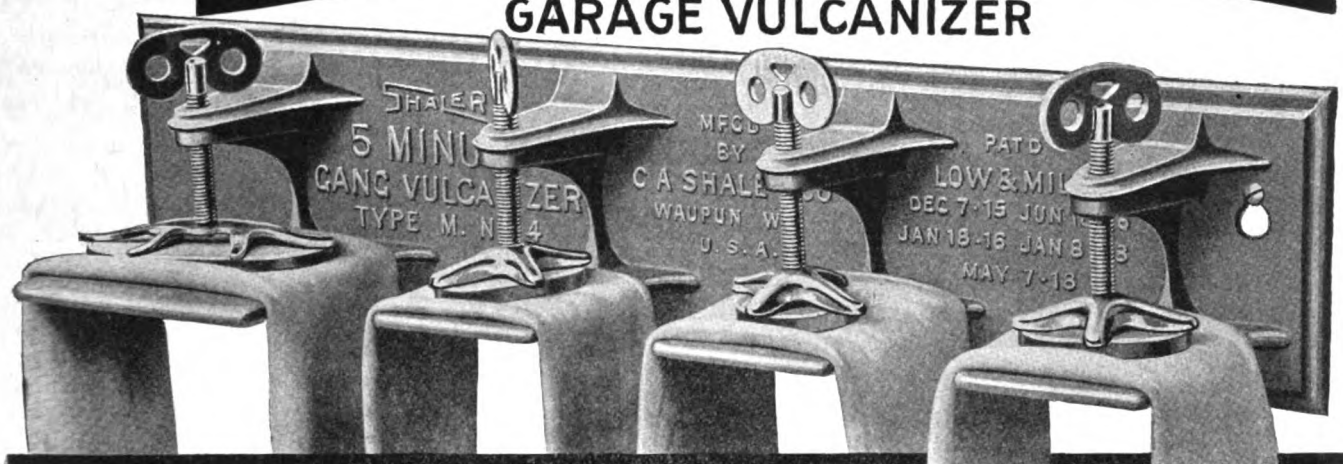
MOTOR TRUCK MOVEMENTS.

C. M. Strieby has been engaged as advertising manager of the Fulton Motor Truck Company at Farmingdale, Long Island, by President W. F. Melhuish, Jr. Mr. Strieby has had a wide experience in the automotive merchandising field. He was a salesman for Chalmers cars in Philadelphia under George W. Hipple and was with E. LeRoy Pelletier's advertising organization at Detroit. Mr. Strieby was advertising manager for the Smith Motor Truck Corporation until a few months ago.

The Grant Motor Car Corporation announces the engagement of Birkett L. Williams as sales manager of its truck department. Mr. Williams comes to the position with a comprehensive knowledge of truck merchandising gained through a large experience in both domestic and foreign fields.

SHALER

5 MINUTE GARAGE VULCANIZER



Complete Outfit \$7

Free Patches Enough to Pay for It

To quickly introduce this wonderful new Shaler Garage Vulcanizer—we will send *Absolutely Free*, with each outfit—an assorted supply of Shaler Patch-&-Heat Units, that will make repairs enough to more than pay for the outfit.

This new gang vulcanizer was designed especially to meet the demand from Garages and Repair Shops for a large capacity, quick action, dependable vulcanizer, that uses the convenient Shaler Patch-&-Heat Units. These handy units are very popular for making tube repairs. Over 10,000,000 punctures were repaired with them last year. No other method is so quick, safe, convenient and satisfactory.

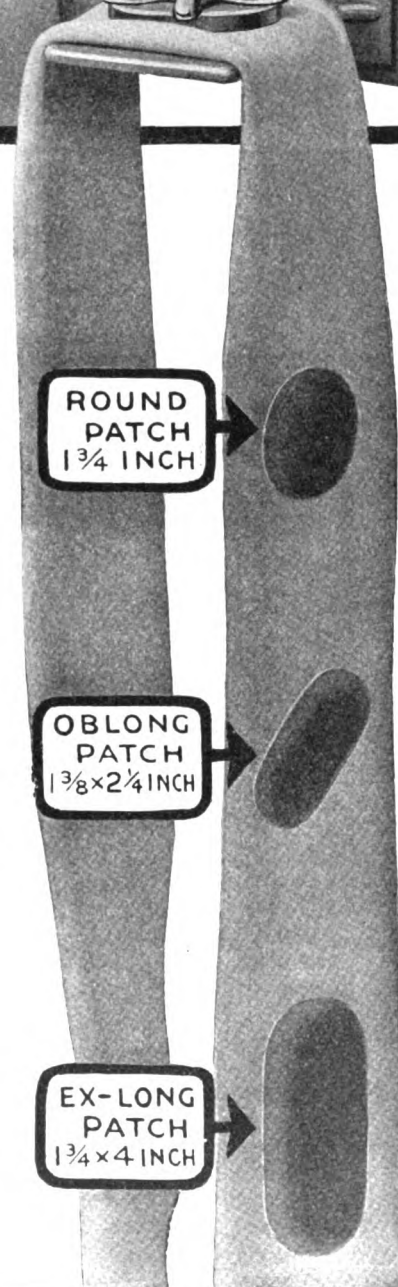
Makes 4 Repairs in 5 Minutes

You can obtain garage size, Large Packages of Shaler Patch-&-Heat Units from your jobber, at prices so low as to make this the cheapest method of vulcanizing. There is no danger—no gasoline, no blaze, no flame, no trouble, no waiting to heat vulcanizer.

Write Quick — or Ask Your Jobber

Our low List Price \$10 is subject to 30% trade discount, making the Net Price to you only \$7—and with the outfit we will send you Free Patches enough to more than pay for it, so that the outfit costs you practically nothing.

C. A. Shaler Company, 365 Fourth Street, Waupun, Wis.



How to Make the Shop Pay

Men Encouraged to Study—New Mechanics Recruited from Ranks of High School Students

By E. B. HINRICHSEN

As Bill went deeper into the welfare work, he found many things that existed which did not tend to produce the best results for both company and men. He also found the lack of more things, the instituting of which would be of benefit to both. He never let up on the loyalty and cooperation drive. He used every means at his disposal to convince the men that the company was for them and interested in their personal affairs as well as in their business relations.

A stranger probably would have failed. But Bill's personal acquaintance with the workers gave him a start and they gradually came to realize that instead of trying to get the most out of them for the least given, the company was actually trying to give an even break. The average garage mechanic nurses the idea that he is only working from day to day, anyway, and that his employer is exploiting him for his own benefit. He lives in hopes that some day he will be able to start out for himself and make for his own all the money that he now makes for the owner. He does not realize the expense and work necessary to keep going and only sees the one side of the case.

The automotive industry has grown so fast that there have never been enough competent men to take care of the repair end. The dealers early established the practice of doing as much for the customer as possible and only considered service as a feeder to sales. Naturally, they maintained the service as cheaply as possible and the result is that the shops have not attracted, as a rule, the class of men which the business really requires.

A canvass of the largest service departments in a middle west city just before the war showed that only five per cent of the mechanics had ever had any high school training, and of these not one had graduated. The remaining ninety-five per cent had only attended grade schools and some of them had mighty little of that.

Wages Not Properly Scaled.

Wages have never been what they should be and have never been properly scaled. The usual practice has been to hire a few experienced men at from sixty to eighty-five cents per hour and fill up with helpers at from thirty to forty cents. The customer has been the worst sufferer from them, although the shop managers have had their share.

Bill had working conditions made as

nearly ideal as possible. The company furnished overalls at cost and also had them laundered. The shops were kept clean at all times. The tool equipment was complete in every detail. Ample locker room and shower baths were provided in order that the men could change their working clothes on the job instead of going home in their overalls. They had a medium sized room which they used as a gathering place at least one evening a week when they discussed things. This room, which they called their club room, was kept well supplied with reading matter of all kinds and a fairly complete reference library was kept. Study was encouraged.

Bill studied hard himself, taking a mechanical engineering course in a night school and never losing a chance to acquire information of a special nature which might help him in his work. He was always willing to pass out any information asked for. If a question came up that he could not answer, he would make a note of it and sooner or later would have the answer. He gave some little lectures himself and Mr. Brown managed to get occasional talks by specialists in various lines that he thought might be useful or interesting. The men were at first inclined to joke about the "school," especially the old timers, but it was kept up and almost without realizing it they finally became enthusiasts.

Bill was always after new men. If he did not need a man at the time, he wanted to know where he was against future needs. He started a student course, drawing mostly from the high school boys in their last year at school. In connection with their school work they took a shop course, working evenings and Saturdays. For this they received a certain amount of pay, enough to keep them interested, and in this way Bill had a crop of new embryo mechanics growing all the time.

Athletic Sports Encouraged.

Athletic sports of all kinds were encouraged and a number of fairly good teams were made up for various events. They were somewhat handicapped in this, as they did not have a gymnasium nor training fields, but Bill hoped these might come some time in the future. In the meantime they did the best they could.

Their city was located in a rich farming country where automobiles were plentiful and automobile racing had become the big event at the county fairs. The first fall after the company opened for business

their racing team won nearly every amateur race meet within a radius of a hundred miles, using cars assembled by themselves. This was considered by Mr. Brown to be good advertising and the initial expense was borne by the firm. When a winning was made the expenses were first deducted and the remainder paid into the "bonus" fund.

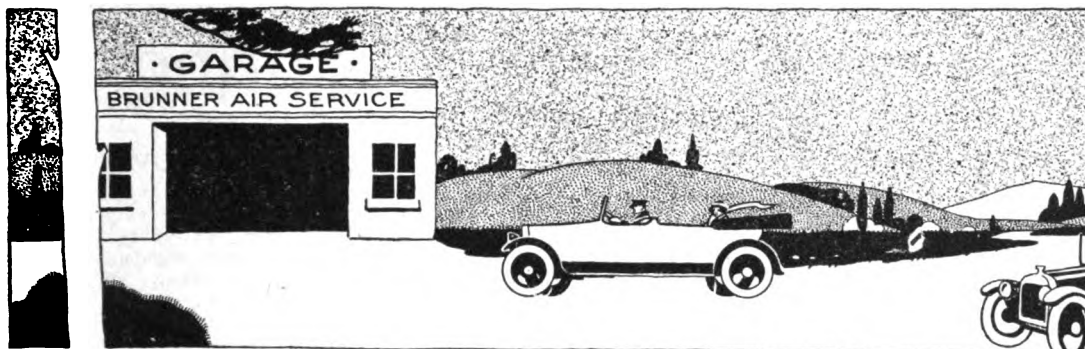
All these things tended to create a general good feeling and spirit of co-operation and gave the men the idea that they were not only working for the company but that the company was also doing its part.

Another New Plant for Pasco Wire Wheel Firm

Officers of the National Wire Wheel Works, Inc., of Geneva, N. Y., that builds the Pasco wire wheel, have recently found it necessary, due to the demand for wire wheel equipment, to extend their business. They have arranged for additional factory equipment at Hagerstown, Md., in order to meet this demand. With these two large factories they will be prepared by June 1 to manufacture 3,000 wheels per day and will arrange their equipment to further increase their production as required.

During the last year practically the entire National Wire Wheel Works plant at Geneva worked on government production of airplane wheels and airplane motor parts, having made 37 per cent of all the airplane wheels used on machines made in the United States. Heretofore, outside manufacturers furnished parts used in the production of Pasco wheels; but with additional facilities at Hagerstown, Md., all parts from rims to pressed steel hubs and shells will be made.

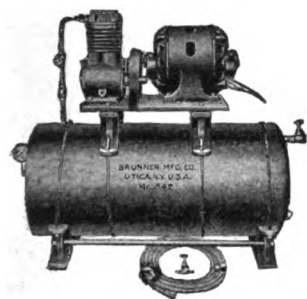
Announcement has been made by Forrest J. Alvin, general manager of the United States Motor Truck Co., of the appointment of Hawley, King and Co., San Francisco, as distributors for the United States motor truck for the Pacific Coast. J. W. Bayard, an eastern representative of the truck company, recently journeyed to the Coast by motor car with his wife and after investigating trade conditions up and down the coast, completed the arrangements.



Does Your Air Service Pay You?—It Should

Some garagemen fail to realize the necessity of an efficient compressed air system. A leaking tank, valve or hose line compels the compressor to work overtime to replace the wasted air, shortens the life of the compressor and increases the operating cost.

A profitable air service requires not only a Brunner compressor, but a Brunner outfit, Brunner fittings, and a Brunner open-hearth steel tank. Ordinary fittings will not do and a "Range Boiler" used as a tank is absolutely unsafe.



No. 542 Motor Driven Outfit

The outfit includes air gauge, check valves, 25 feet of 3/16" "Resistoil" air hose connected to one No. 82 needle valve on one end and having automatic tire connections on the other.



Get a Brunner Air Sign

It is your best advertisement. It tells the motorist of a garage service sure to please. It gives the motorist confidence in your garage. Display it.

INSTALL A **BRUNNER** GARAGE AIR SYSTEM

This No. 542 Brunner motor-driven outfit with a Model M Brunner automatic controller will automatically maintain a working air pressure between 115 and 140 pounds and will save you both time and labor and will greatly increase the efficiency of your air service. It has ample capacity for garages, housing up to 40 or 60 cars; the motor is half horsepower, securely bolted to substantial cast iron base and mounted on a thirty-two gallon open hearth flange steel air tank, tested to 300 pounds. The compressor is our No. 102 two-cylinder, air-cooled, each cylinder fitted with safety valve that can be instantly set for any desired pressure and absolutely dependable under all conditions.

Let us send you Catalog No. 50 and the name of the jobber handling Brunner Compressed Air Systems in your territory

Brunner Manufacturing Company

General Office and Plant: Utica, N. Y.

Cincinnati Branch, Cincinnati, Ohio



Tractors and Farm Lighting

BY M. E. FABER.

If It's Good Enough to Sell, It's Good Enough to Use.

That's the slogan of the Prison City Motor Co. of Waupun, Wis., when it comes to selling farm lighting plants. With them it's not only a matter of selling light and convenience and simplicity, but a matter of convincing a prospect of the permanent utility of the plant he buys.

So, when they have a prospect who wants to know who is using one of these outfits that they talk so well about, they answer right up and say, "Why, we use it ourselves."

Then they take him over into a corner of the stock room and show him the little Delco Light engine and generator that illuminates their entire garage from the basement to the big sign out in front.

There could be no better answer to the question than to show the prospect as they do, that they have full confidence in the plant that they have chosen to back with their own reputa-

tion. No selling talk could take the place of the continuous demonstration that the lighting plant itself conducts. The proof of the method is that it sells the goods.

But there has developed an additional advantage. With plenty of electric current at a minimum of cost, these live merchants have been able to brighten up their place of business in a way that had seemed out of the question when they bought their current by the kilowatt from the city. As an advertising feature it has made their garage known as the brightest spot in town. Plenty of light naturally implies better service, and the service backs up the appearance.

The installation was easily accomplished since the building was already wired for city current. Practically all that was required was to hook up the generator to the existing wiring and install lamps of the proper voltage. Anyone could do it and the slight expense involved would be repaid manyfold by the advantage gained.

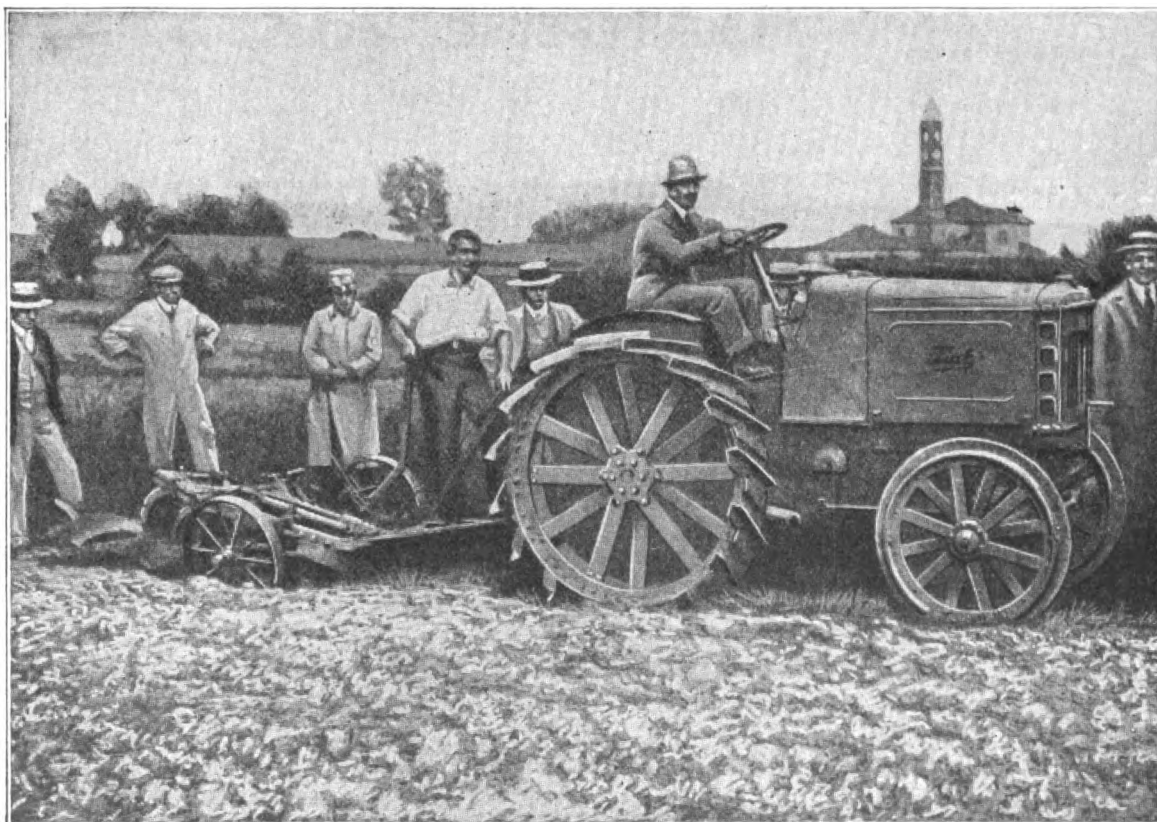
IN THE TRACTOR FIELD.

Leo M. Rumely has been made vice-president of the Parrett Tractor Co., of Chicago, according to an announcement of Claire L. Barnes, vice-president and general manager. Mr. Rumely, who has directed Parrett sales for the last year, is now in charge of the sales, advertising and service departments.

The Cleveland Tractor Company announces the appointment of Captain E. A. Callanan to the position of general purchasing agent. For five years he was assistant general purchasing agent for The Willys-Overland Company at Toledo and later was a manager in the branch department of that organization. For the last fifteen months he has been in charge of the production of de Havilland battle planes at the Dayton-Wright plant, Dayton, Ohio, which was the only one in the country actually to get battle planes to France.

Sutherland G. Taylor, Jr., has been appointed export manager of the Holt Mfg. Co. at Peoria. For several years he was vice-president and New York manager of Cyrus Robinson & Co., engineers and exporters of New York and London. Mr. Taylor recently received his discharge from the United States Army, where he served as assistant to Major Carlisle, Chief of the Motor Equipment Section, Procurement Division.

R. C. Greth has been appointed district representative of the Cleveland Tractor Company in the Oklahoma territory. He has been in the automobile business in Phoenix, Arizona, prior to which he was associated with the Overland and Hudson companies as special representative.



Flat farm tractor that was developed during the war to increase food production in Italy. This product of the famous automobile concern at Turin is known in the country of its origin as the "Trattrice Agricola Fiat."

How E. J. Harvey Established a New Quality Standard for Automobile Springs

TODAY automobile dealers can supply their patrons with a spring that is both easy riding and practically unbreakable, thanks to the skill and perseverance of E. J. Harvey of Racine, Wisconsin.

For a long time, the spring was almost overlooked in the consideration of automobile construction. It was taken for granted that a bump in the road meant a bump to the automobile riders. And a broken spring now and then was accepted as a matter of course.

E. J. Harvey, a man with much manufacturing experience and an inherent characteristic of doing things right, saw the importance of the spring in motor car construction. He saw that easy riding, non-breakable springs meant more than just comfort and safety for car occupants. He saw the vital relation of spring action to car up-keep—the effect of springs on mechanism and tires both.

He then set out to build the perfect automobile spring. But even when improved processes of manufacture

and general design had created a spring of unusual resiliency and strength, the problem was far from solved. Then the individual requirements of each make and model of automobile built had to be considered separately, for each presents a different spring problem and requires a different spring design.

But Mr. Harvey's skill and perseverance conquered all these obstacles, and today, there is a carefully designed Harvey Spring, of genuine Harvey standard construction, for every make and model of automobile.

And the Harvey selling organization places the fruits of Mr. Harvey's work within easy reach of every automobile dealer. No matter where he is located there is a Harvey jobber near who can supply him on a moment's notice *any* Harvey Spring he needs.

The Harvey Spring Book, which is sent free upon request to any dealer, lists all the different styles of Harvey Springs (900 of them), gives their weights and measurements, and tells you about the features that make the Harvey the highest standard automobile spring manufactured today.

In writing for this booklet address

Harvey Spring & Forging Co.

1043 Seventeenth St.

Racine, Wisconsin



Mechanical and Engineering Problems

By E. B. HINRICHSEN

Radiator Temperature

Question—I have a 1911 or 1912 Oakland that worries me a little. I think it heats too much. The water does not boil but the radiator gets so hot that I cannot lay my hand on it. I have the carburetor cut down as lean as possible, the fan gives a good blast and the water circulates well. This car has always heated this way but I thought it was all right until a friend of mine told me that the water should never get more than lukewarm. I have made some long tours and want to make another this Summer and want to know whether I am hurting anything.

K—Illinois.

Answer—I am afraid your friend is drawing from his knowledge of misinformation. If the water does not boil or steam I am of the opinion that you are getting just about the right temperature to have a good working condition. Go ahead and take your tour and don't worry.

* *

Drumming in Clutch

Question—We have in our garage for repairs a 1918 model Dodge touring car which has developed the following troubles since the owner purchased it last July. This car was the 1918 "demonstrator" of the local Dodge agent and had been run, according to the present owner, about 2,400 miles at the time he purchased it; since that time he has run about 1,000 miles. This car runs fairly quiet up to 15 miles an hour, but above this speed a drumming vibration seems to develop, apparently in the transmission or clutch. In engaging and releasing clutch with the gears out of mesh, there appears to be about a quarter inch of play or lost motion in shifting fork before it takes hold. Would you consider this excessive?

Compression in all four cylinders of motor is good when cranking by hand after motor is warmed up. When motor is idling there is a distinct knock which disappears when the clutch is thrown out. There is no scoring in cylinders and connecting rods and main bearings have been recently taken up. After running car from 15 to 20 miles motor starts to lag and is hard to accelerate and there appears to be a pronounced lag in its operation.

About two months ago this car was in our garage for repairs and we found that the pin holding the high speed internal gear to the sliding gear shaft was loose, allowing play of gear; this we repaired but it did not clear up vibration. The distributor head of the ignition system has been cleaned and breaker points adjusted and seems to function properly. Carbon has

been cleaned from head, valves ground and adjusted to .004 cold. In removing the valves for grinding, we found two of the valve stems hard to remove; they seemed to stick in the valve guides but did not appear to be gummed as the stems were highly polished and dry. We cleaned "mushroom" from under side of heads on valves, ground them in to good seats, and lubricated stems in replacing, but motor seems to lag as badly as before after about 20 miles of driving.

Carburetor is set lean as the owner obtains about 22 miles per gallon of gas. In running he claims he does not exceed 25 miles an hour at any time. The brakes do not drag on drums, and water did not boil in radiator when he gave it a 20 mile test. The owner runs with well advanced spark excepting on steep grades. No trouble is experienced in making nominal grades in high gear when motor is cool at start; but this is absolutely impossible after running at normal speed for about 20 miles. Motor does not seem to lose compression and crankcase does not get hot. Oil level in crankcase is kept up at all times according to owner. Standard medium oil is used.

Can you advise us why this motor seems to have ample power when cool at start and lags after being warmed up when just the opposite should be the case? Your opinion regarding these troubles would be greatly appreciated.

M. G.—Conn.

Answer—The drumming is probably due to either a bad clutch throwout bearing or a bad front transmission bearing, I rather think the latter. After the clutch is thrown out and the master gear stops spinning the noise disappears. This is a sure indication that the trouble is back of the clutch itself. If it is the clutch throwout thrust bearing, it will probably have to be replaced. If it is the front transmission bearing, adjustment will probably cure it.

The fact that the car is quiet up to fifteen miles an hour would also indicate that it was the transmission bearing. At slower speeds, the two high speed gears locked together would support the bearing to a certain extent and probably keep the shafts running true. As soon as the vibration from speed became so great that this support was no longer sufficient, both the spline and clutch shafts would begin to run out of true, making the noise.

There are several things that could cause the loss of power after the engine is warmed up. The most natural assumption would be that there was a loss of compression past the pistons after the oil became heated, but this would cause heating of the crank case which you say does not occur. The loss is undoubtedly due to loss of compression if you have checked

up on the other points as you say. It may be that one or more valves are adjusted too close. Try a wider adjustment on the tappets and see if that helps.

You drop a valuable hint when you say that two of the valve stems seemed to be tight in the guides. Risk spoiling a couple of valves and grind the tight ones down a little. This motor has a detachable head. I have known cases where a stud bolt was so located that it pulled a valve seat out of true when the motor became hot. I have also seen cases where a head leaked after the engine became hot. It is probable that the trouble is in only one cylinder or at most, two. The best way to locate the spot is to drive the car until it begins to fail in power and then to make a compression test as quickly as possible, using a gauge in doing so.

Don't trust to trying compression with the crank. It will often fool you. Attach the pressure gauge as quickly as possible after stopping and if you have one use a stop watch to get your time for holding compression. You will probably learn some compression tricks that will surprise you. In a case of this kind it is largely a matter of tests in order to locate the trouble definitely.

* *

Engine Slows Down

Question—We recently installed a large stationary engine for a firm here to run a lighting plant. We bought the engine, dynamo, power board and storage battery through a good reliable firm. Our customer had both engine and dynamo equipped with tachometers and is complaining because the engine slows down when the circuit is first closed to the storage batteries. We tell him that is all right as the engine picks up right away afterward but he is not satisfied. Is there any way we can adjust the governor or anything else to overcome this?

M—Iowa.

Answer—I do not see anything wrong with this. It is hard to construct a governor that will act instantly and if it would a slow speed engine would not maintain an exactly constant speed under these circumstances. I have seen the same thing happen even when a plant of this kind was very much over-powered and the engine equipped with unusually heavy flywheels. Try to convince your customer of this and write the firm from whom you bought the plant. They will write him or else send a man to explain why this condition must exist. It is probably just another case of some one acquiring some superficial knowledge and attempting to apply it. The idea of the tachometers is good though.

ROMORT PRODUCTS

The Pioneer Automatic Air Valve STILL IS KING OF THEM ALL



Style "A" Automatic Air Valve

The ROMORT Automatic Air Valve, Style "A," was the first ever put on the market. Since the first day it has had no equal for free air stations.

It is guaranteed to render the prompt and efficient service that brings the customers back to your garage, and builds business.

ROMORT experience has produced this valve that withstands the roughest usage and abuse.

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Welding, Cutting and Brazing

The Oxy-Acetylene Flame

By DAVID BAXTER.

In line with the articles in the last two issues of this magazine, concerning the understanding and care of welding equipment, something on the subject of the welding flame will be appropriate. The flame should be "taken care of" just as much as the mechanical devices employed by the welder.

The welding flame is something more than a hot point of burning gases, to be handled in haphazard manner. It should be watched continually throughout the entire process of welding; if the standard neutral working flame is being used the operator should not be satisfied to merely set the regulators at the commencement of a job of welding, but should watch them and the flame continually. About the only course open to the average welder for judging the correctness of his flame is through the appearance of it. He must know just how a correct flame looks so he may regulate it the moment it varies. Again the welder is forced to rely upon himself: he can learn the appearance of the flame only by observation and practice. In time this comes to be a sort of instinct or second nature.

To obtain a perfect welding flame is the chief concern of all reliable manufacturers and designers of welding apparatus. The flame is the essential feature of the whole process and yet very scant data is available. Comparatively little has been published concerning the elements and factors that combine to make the welding flame and most of it is replete with scientific terms and technical phrases. Of course these are very valuable but are puzzling to the fellow who handles the torch.

Combustion Is Rapid.

First let us understand of what a flame consists: Flame is the result of a chemical action between certain substances; more rapid in some cases than in others. The common term for this action is "combustion" or burning. Combustion must first of all have a combustible—something to burn. It must also have something to support it—to keep it burning. There are any number of combustibles but they all require the same supporter to a greater or less extent. This essential supporter of combustion is oxygen; without it no fire can burn. It must be supplied by the atmosphere or furnished by artificial means. Then, the oxy-acetylene flame is a rapid chemical action with acetylene gas as the combustible and oxygen from tanks as the supporting element.

The oxygen taken from the atmosphere is, however, scarcely more a benefit than a detriment; some kinds of welds are harmed through this agency. The chief supporter of the oxy-acetylene flame, then, is the oxygen fed to it through the hose connected to the pressure tanks. This pressure is such that little or no air is consumed in the actual welding part of the flame—the little white cone at the orifice of the torch. The pressure undoubtedly carries most of the oxygen of the atmosphere along to the outer envelop of flame.

A definite amount of acetylene mixed with a certain amount of oxygen fixes a certain temperature at which the combustion commences. This temperature is called the "point of ignition" and is approximately 480 degrees Centigrade. If the heat generated during combustion is enough to keep the temperature above the ignition point the flame will continue to burn.

Flame Has Three Parts.

The oxy-acetylene flame has three distinct parts, the inner cone, the luminous cone, and the outer envelop. The inner cone is non-luminous, being merely the mixing of the two gases previous to ignition. The intermediate cone covers the inner cone like a mantle or crown within which the first steps of the combustion take place. The outer flame is the result of the burning of the products of combustion from the middle zone with the oxygen from the atmosphere; the most of it being non-luminous. There are other divisions of the flame other than those mentioned but as they are not readily perceivable at all times it seems scarcely advisable to introduce them lest we become confused.

There are three graduations of the flame as employed by the expert welder; the standard neutral flame consisting of a balanced mixture of both welding gases—half oxygen and half acetylene; the reducing flame which carries a trifle more acetylene than oxygen; the oxidizing flame which carries a trifle more oxygen.

The reducing flame is lower in temperature than the oxidizing flame; also lower than the neutral flame. The neutral flame is the best for all purposes, especially if the torch operator is comparatively new at the business. The reducing flame is used but sparingly on certain kinds of metal, such as aluminum, zinc, etc., having a low melting point. Even then the welder must be careful or he will ruin the metal in the weld. In employing this flame it is well to direct the flame across the surface of the weld and not straight into the melting weld.

The oxidizing flame is perhaps the most difficult to employ on account of a dan-

gerous tendency to burn up the metal. It is usually only used on very heavy jobs of cast iron and then only to enable the operator to handle larger quantities of metal in the weld; it helps to shorten long, hot jobs by melting faster. The excess of oxygen, however, should be very slight in any case.

Keep Flame in Motion.

Either kind of welding flame should always be kept in motion swinging back and forth, or around and around in tiny circles, most of all an oxidizing flame. This should not be allowed to come to rest over any part of the weld for more than a second or so when the metal is melting. For fear of a misunderstanding I wish to say quite plainly that I do not recommend the use of other than the neutral flame on all classes of work and especially for the novice. But either of the other flames may be used at certain times if the torch is manipulated properly.

In order that we may know the different flames let us light the torch and adjust it to the different flames. First, after setting the regulators and opening the tank valves, open the acetylene cock on the torch, then immediately apply it to the lighter. Do not hold the torch to the lighter and then turn on the acetylene, but wait until the acetylene is coming out before lighting it. This aids in preventing carbon from forming in the tubes or tip of the torch; the carbon has an adverse effect on the quality of the flame.

When the acetylene gas is lighted it spreads out in a large yellow flame. This flame is gradually cut down by slowly closing the acetylene cock and at the same time slowly turning on the oxygen pressure. As the oxygen is increased we notice the yellow flame turn to a smaller pointed ragged tongue, blue in color and very irregular. This blue tongue of flame is shortened and lightened as we approach the neutral point. While it is still sharp and bluish appearing, just before it reaches the neutral stage and while the acetylene is yet the stronger, it is what I have termed the reducing flame. This is also called a carbonizing flame due to its carbonizing effect on metal. For instance, it carbonizes mild steel by making it hard and brittle.

Neutral Flame Is Best.

To reach the neutral stage we keep cutting down the acetylene pressure until it equals that of the oxygen. When both are balanced or equal we have the standard neutral welding flame. It has lost the ragged bluish look and is no longer sharp but abruptly blunt. The color is blinding white, injurious to the naked eye. This flame if handled correctly will not injure any metal.

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The first payment brings the sign—you have 12 months to make the final payments and you get the service of this energetic salesman while paying for it. This "Silveray" sign is distinctive. The glass, opal color letters permit all light to shine through at night. A separate bulb for each letter—current cost very low.

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Now suppose we keep on shutting off the acetylene until the oxygen predominates. We then notice that the blunt cone begins to shorten, also to become more pointed. It is oxidizing in character, however, before it becomes very sharp so it is well to be careful when attempting to use an excess oxygen flame. An extremely oxidizing flame is useless so far as welding is concerned. The excess oxygen flame tends to burn the metal, causing it to blow out in a shower of sparks when welding steel. The sparks are a good indicator that the oxygen is the strongest.

To go back again to the neutral flame we have only to decrease the oxygen or increase the acetylene until the blunt white pencil of flame is again apparent. The careful welder is not satisfied with one regulating of the neutral flame but will test it from time to time throughout the job. A good way to do this is to increase the acetylene until the bluish ragged edge begins to appear, then cut down the acetylene until the ragged tongue changes to the blunt white cone. Do this testing at regular intervals when working on long jobs where the heat of the weld is apt to cause the gas to expand and effect the

quality of the flame, without the operator being aware of the fact.

Heavy work of thick section requires a larger flame, not necessarily a flame of higher temperature but a bigger quantity of heat. This is best accomplished by changing to a larger welding tip; one with a larger drill size. The different flames are the same in all sizes of tips. That is, the neutral, or other flame, is the same shape, and is obtained in the same way for the large tip as it is for the smaller ones. The difference lies not in the quality but in the quantity of the flame.

Different Sized Flames.

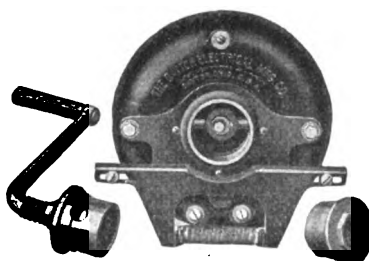
It might perhaps be clearer to refer to the different sized flames instead of the different sized tips when recommending the choice of various tips according to the weight of the job. For instance, where a job requires a number five tip let us say a number five flame. In this way we should be able to fix it in our minds that it is not more temperature we want but a larger quantity of heat. On light work of thin section a small flame is selected because it will not endanger the metal of the filler or the job to bad effects if properly handled.

On most light work it is well to have the flame strike the weld at an angle, preferably in the direction of the welding, as it then heats the line of the weld in advance preparation for the coming flame. The force and spread of the outer flame also tends to prevent oxygen of the atmosphere from attacking the melting metal.

If the welder attempts to employ a large size flame on light work he has to contend with the force of the flame besides a large amount of heat. If he is careless or neglectful he may ruin his weld beyond repair by simply holding the flame too close to the weld or by pointing the flame straight into the heart of the melting weld. It should not take him long to decide that he is using too large a flame. A flame too large will cause the melting metal to be blown about in a manner most difficult to control. A flame too small for the work will have the opposite effect; it will not melt fast enough nor in large enough quantities to join the sides of the break, which is bound to result in a poorly knitted weld; one having spots underneath the surface that are not melted together.

Dayton Chainless Starter Spins Engines of Ford Cars

The Dayton electric starting, lighting and ignition system for Ford cars is described as "the chainless, clutchless and gearless system that SPINS the Ford engine." It is possible to connect it direct to the crank shaft because of the new armature used in the motor-dynamo, which is of an entirely new construction and a recent invention of Vincent G. Apple.



Complete Motor-Dynamo and Crank

commutator a part of the winding, thus preventing open circuits.

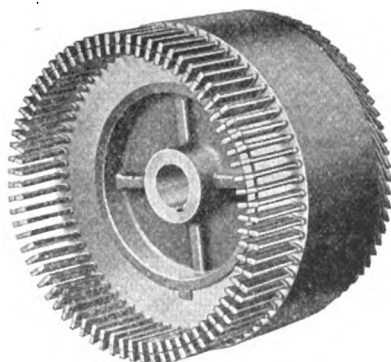
After the armature is assembled, it is impregnated with bakelite and baked, which makes it a solid homogeneous mass impervious to damage by heat, oil or water. This armature can be shaped to fit the frame of any low-voltage dynamo using the same sturdy construction.

The field frame of the motor-dynamo is made of semi-steel and has twelve field poles in which the armature rotates to generate the electric current.

The brush assembly is on the back of the motor-dynamo front plate. Instead of using two large brushes to carry the starting current, they are divided into twelve parts in order to give the "finger" action, so desirable for commutator brushes. Two of these brushes are almost pure graphite for lubricating the commutator, thereby eliminating any necessity of using oil on the commutator.

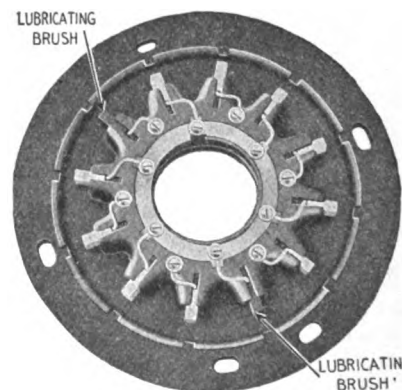
The other ten brushes are made of metal graphite composition. As the brush assembly is of the "finger" type, there are always two or more making contact to generate the electric current.

When released, it automatically comes back to the running position and the motor changes to a dynamo which generates the electric current to recharge the 6-volt battery. This replaces the current which was used by the motor for cranking the engine and lighting the lamps. When the voltage of the dynamo drops below the charging rate, the cut-out in the switch automatic-



Hair Pins Shaped to weld on Commutator

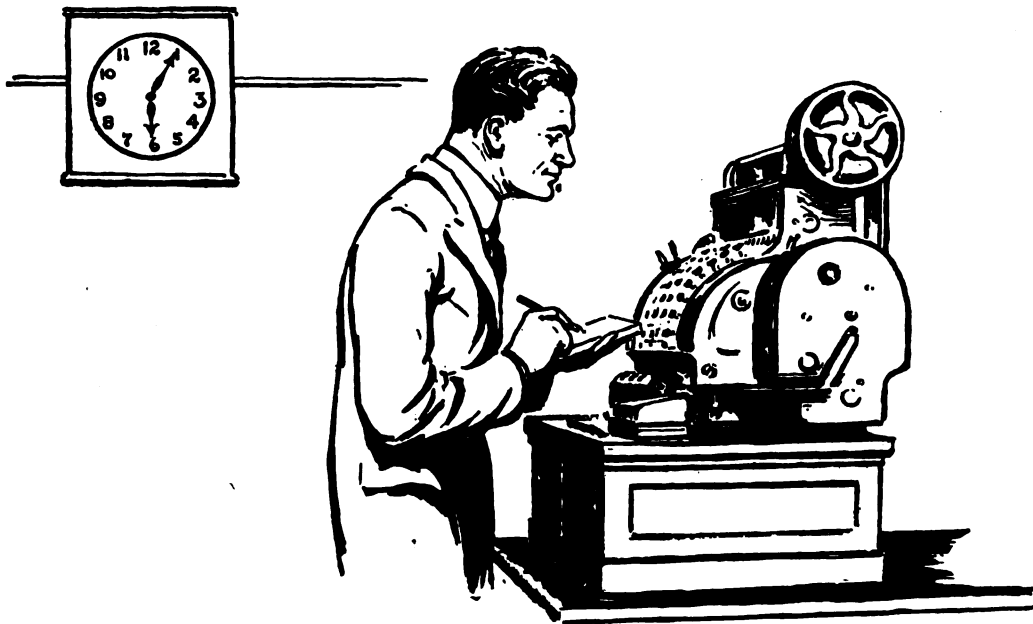
There is no cotton insulated wire used in its construction, the windings being made with flat copper strips cut to length and formed into hairpin loops which are inserted through a number of laminated iron discs. They are then bent into shape by a special machine to make them uniform, leaving the flat ends to weld to the commutator segments, which makes the



Commutator Brush Assembly

ally breaks the circuit between the dynamo and battery so that the battery will not discharge when the car is running at too low a speed or when the engine is at rest.

Further information and trade prices will be sent to dealers who write to the Dayton Electrical Mfg. Co., and mention the American Garage & Auto Dealer.



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The Home of "Ever-tyte Bill"

The Evertight piston ring, commonly known as "Ever-tyte Bill," lives in a home at St. Louis, of which Bill's sponsors can be proud. The factory of the Evertight Piston Ring Co. is a modern-constructed day-light, fireproof building. Ground area has been provided to allow for expansion and further growth. The visitor to the Evertight Piston Ring Co.'s plant is first impressed with the continuity of the work.

All the employees are carefully intent on doing their best. The work moves along progressively, from the induction of the raw material into the plant, to the completion of the finished piston ring.

The Evertight piston ring was developed on the principle of three-point radial expansion, which principle secures a close fit to the bottom of the piston groove, thereby eliminating a space for carbon to deposit. Perfect radial expansion is secured because the basis of this construction is the fundamental principle that each sectional unit, when locked together, must be of equal strength.

It is said that there is perfect pressure at all points, thus providing for mechanical efficiency and insuring against waste. The gaps are fully protected. Each Evertight piston ring is uniformly made and manu-

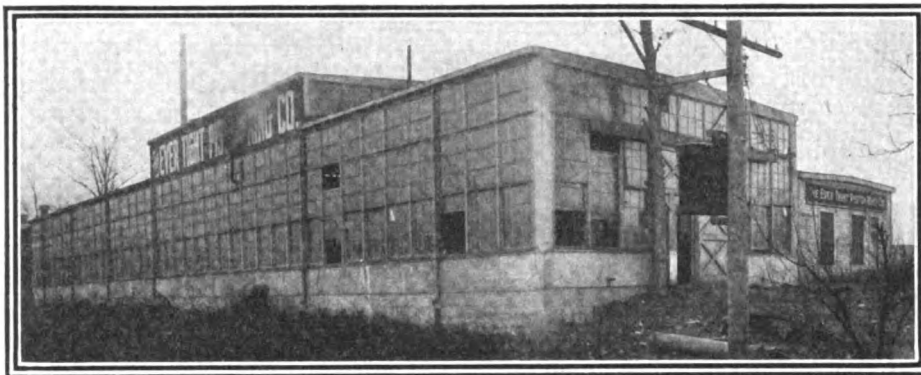
claimed, and it is a mathematical fact that to be capable of expansion, a ring must expand from three points.

The right angle interlocked makes the Evertight piston ring gas-tight. The outside sections of the ring fit into a groove in the inside section. All three sections are free to move, taking care of expansion. But because of the groove in which the two outside sections lock, the ring seals itself. Another feature which the manufacturer desires to emphasize is that Evertight piston rings fit out-of-round cylinders, as well as true ones.

Evertight piston rings are made for a variety of purposes, and it is interesting to announce in this connection that a new style Evertight ring has just been developed which will be an ideal size for Fords. The new ring is of three-piece effectiveness, but of one-piece simplicity.

The present offices of the Evertight Piston Ring Co. are being removed from the factory to 3124 Locust street, St. Louis, where a service station is also being established in connection therewith.

The officials of the Evertight Piston Ring Co. are W. A. Zelnicker, president and treasurer; Rodney Hallam, secretary and general manager, and J. W. Reinholdt, vice-president.



The Evertight Plant.

Numerous micrometric tests are made at various stages of manufacture, to ascertain that the piston ring is uniformly correct in every detail. It is this thoroughness, both in the selection of men and materials, and in care in manufacture, that has contributed so much to the popularity of Evertight piston rings.

The accompanying illustrations give a good idea of both the exterior and interior views of the factory. Evertight piston rings are accurately machined, and all cut-outs are pre-determined.

factured from the finest grade of gray iron obtainable. Holds its shape, tension and perfect fit permanently, it is claimed.

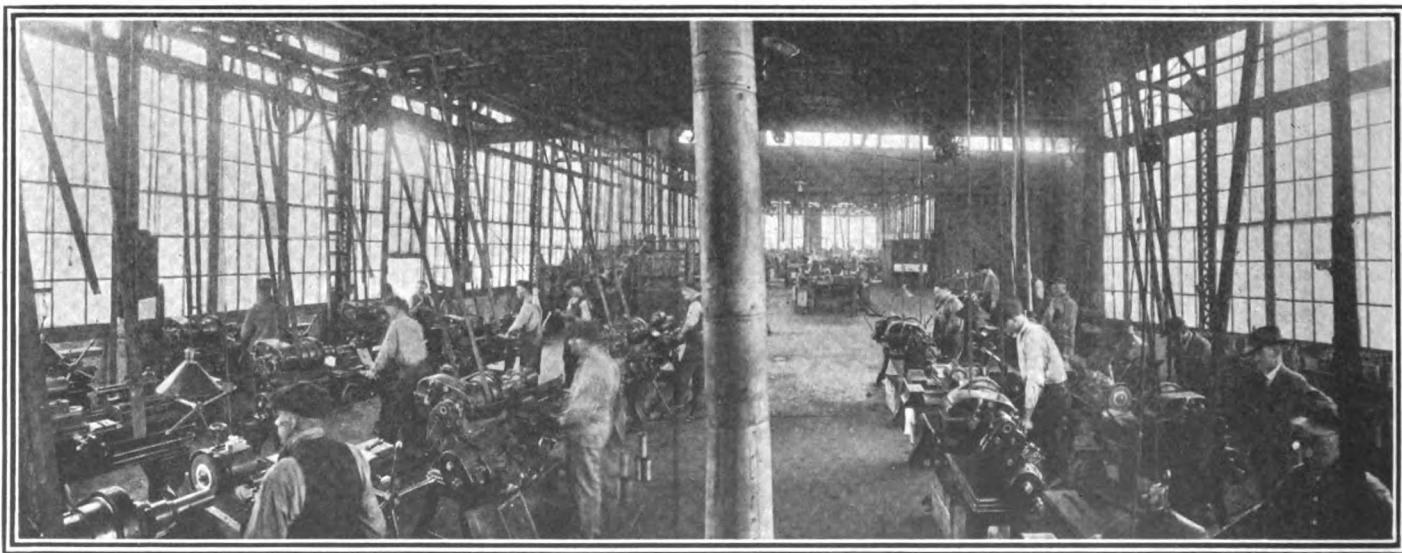
The Evertight piston ring is made in three pieces, primarily, because it is said that three-piece construction prevents any gap in the ring; also a piston ring must be capable of expansion, so that it will hug the inside wall of the cylinder.

The inside of the cylinder is a circle. To hug the inside of the cylinder at all points, the expansion of the piston ring must be an absolutely true circle, it is

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H-B ball bearing electric motors are said to be so simple and compact, so easily started and handled, so economical and efficient that they are used as a source of power in many industries, ranging from small machine shops to great steel plants. These motors are especially valuable where there are individual machines or groups of machines that need to run only when work is being done.

The H-B ball bearing electric motors are built to make money and save money for their owners. They are designed for heavy service, being very conservatively rated and ample in capacity. They require little or no attention, operating continuously, efficiently and economically on city current. The Hobart Brothers Co., Troy, Ohio, has a very attractive time payment proposition for garage men, repair shop owners, and service station operators, that they will be glad to explain to tradesmen who write to them asking for particulars.



Manufacturing "Ever-tyte" Piston Rings.



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The JEWELL Battery Gauge instantly indicates Short Circuits, Failure of Charging Currents, Low Water.

Not a fad or an ornament, but one of the most valuable and necessary accessories ever put on a car.



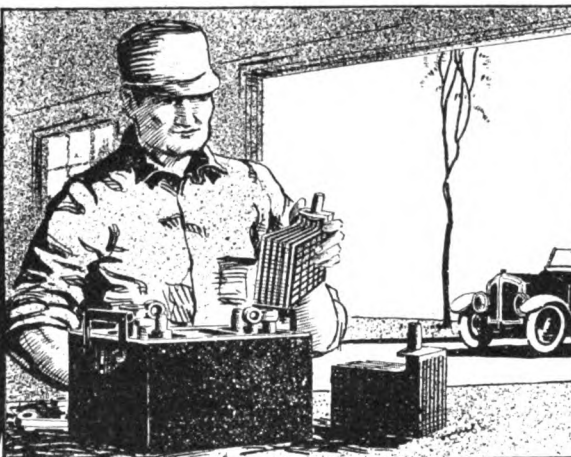
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UNIVERSAL BATTERY COMPANY
3414 S. La Salle Street CHICAGO, ILLINOIS

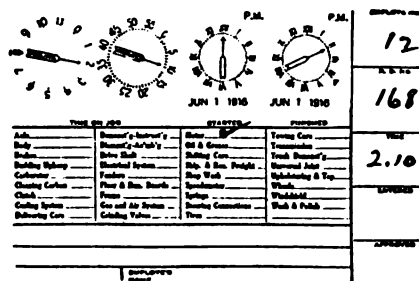
Makers of Universal Starting and Lighting Batteries and Originators of the Sealed Glass Cell. A complete battery for every popular make of car and a repair part for every standard make of Battery. Also manufacturers of vehicle plates and parts for both pleasure cars and commercial trucks.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Accessories and Garage Equipment

CALCULAGRAPH USERS CALL DEVICE TIME CASH REGISTER

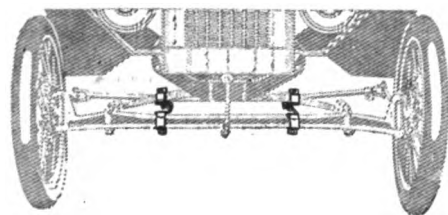
One of the greatest advantages about using a Calculagraph is that the owner of a repair shop or service station is always able to tell exactly how much time has been devoted to any job. When this device is used to stamp the job card both the shop owner or service station operator and his customer knows the hour and minute at which the job was started and when it was completed.



It is not a good practice to guess on the length of time needed to repair an engine, adjust a carburetor or fix a loose brake band. Employees are not likely to have a very definite idea as to the length of time they worked on any one job. When employees "guess" that some job of repairing or adjusting required five hours and the owner charged for that much time happens to know the work was done in 4 hours and 10 minutes there is sure to be a dispute and much bad feeling. A device that will stamp the time of starting and finishing jobs will enable the repair man to give a square deal to his customers and should result in more profit for the repair shop owner. Many users of the Calculagraph call it their time cash register. The Calculagraph Company, 30 Church street, New York, will send a booklet to repair shop owners and service station men who write for it.

SAFETY AND COMFORT FOR FORD OWNERS

The Stopshock is a new device for Ford owners that makes it possible to ride in

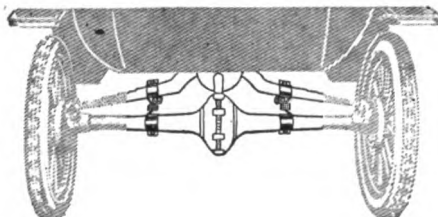


safety and comfort, by eliminating the side sway, jolts and road shocks. A set of four

Stopshocks—two in front and two in the rear, located between the springs and axles, right where the shocks come and the strain is greatest—are said to make any Ford ride as comfortably as a large touring car with a long wheel base. The Stopshocks govern the action of the springs, protect them from breakage and absorb the jars and jolts.



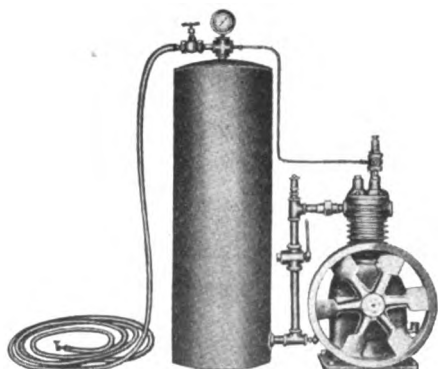
They snub the rebound and make a Ford ride as comfortably at twenty-five or more miles an hour as at twelve. They cushion the sudden downward drop, reduce the wear on the motor and axles, prolong the life of the car, give more mileage to the gallon of fuel and increase tire mileage.



There has long been a demand for a low-priced device that would eliminate shocks and snub the rebound. The K-S Supply Company, 427 Fisher Building, Chicago, manufacturer of Stopshocks, is arranging for distributors throughout the United States to supply the demand for this device.

NEW STYLE "S" CURTIS AIR OUTFIT.

The Curtis Pneumatic Machinery Co. of St. Louis is offering on the market a new outfit known as Style "S." The outfit includes an air compressor with hand unloader and tight pulley, welded steel pres-



sure tank with air gauge, drain cock and pop safety valve.

The piping between compressor and tank is made specially substantial and of convenient pattern to save floor space and prevent breakdowns and trouble. Has an

outlet cock made in five different sizes, up to the usual Curtis standard of excellence, and is ideal for those seeking a complete outfit at a minimum outlay. The Curtis Pneumatic Machinery Co. issue an interesting little booklet which is sent free to those interested. Write for it.

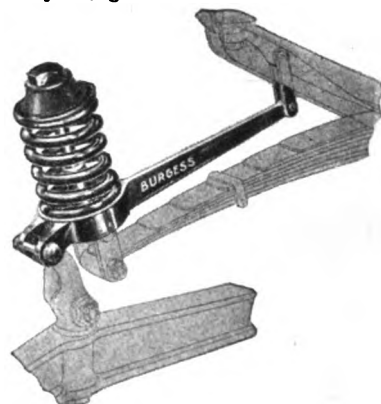
UNIVERSAL BATTERY FIRM PLANS COMPLETE SERVICE

The Universal Battery Company of Chicago announces a complete battery service for garages and service stations. The concern is equipped to make immediate delivery of plate terminals, connectors and separators for all kinds of batteries.

As the firm is the maker of the Universal starting and lighting batteries and also the originator of the sealed glass cell, it is especially fitted to furnish complete batteries for every popular make of car and a repair part for every standard make of battery. The company also manufactures vehicle plates and parts for both passenger and commercial cars.

NEW BURGESS REBOUND CHECK AND SHOCK ABSORBER

The new Burgess rebound check and shock absorbers ride the car and passengers directly on four coil springs, which are so mounted that no guides or other retarding mechanism is required. These springs will absorb ninety periodic vibrations per second. All shocks and vibrations are absorbed when they pass through this rubber topped spring, before they reach the car or passengers.



The Burgess is made to meet all road conditions that cause riding difficulties. The big bumps are neutralized by the cylindrical coil spring which is also fast enough to absorb the rapid jolts that are too fast for the leaf spring. The rubber spring cap is an exclusive Burgess feature. It breaks the metal to metal contact between the axle and the car body. Another new feature is the hardened steel shackle and bushing so that there is no opportunity to wear out. It controls sideways and makes steering easy.

The arms on which these springs are mounted are arranged to control the recoil of the leaf spring by shifting the load at the moment of recoil from the tip of the spring to the center or thickened portion. It is made by the Walter S. Burgess Mfg. Co. of Chicago and St. Joseph, Mich.

CINCINNATI SPECIALTY FIRM ISSUES NEW CATALOGUE

President A. W. Connor, of the Cincinnati Auto Specialty Co., announces that his concern has issued another catalogue from its new quarters at 312-314 Main St., Cincinnati, Ohio. The firm now occupies two buildings, each of five stories, and running an entire city block in length, which provide 22,000 square feet of manufacturing space.

The new catalogue, which is the 1919-1920 publication of the firm, is a well illustrated booklet of 24 pages. It contains descriptions and prices of "Stik-Tite" windows and "Stik-Tite" roof patches, tops and top coverings, "Frost King" radiator and engine covers, the new Keystone door, and a number of other articles of automotive equipment produced by the concern. Copies of the catalogue will be sent to tradesmen who write for it.

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....

.....

.....

Name

Address

AT LAST!! A FORD STARTER THAT STARTS!

BUILT FOR THE JOB

1. NO Gears, Chains, Belts, Clutches.
2. It SPINS the engine.
3. Single Unit—Direct-connected.
4. Automatic regulation.
5. Easiest to install.
6. Complete to smallest cotter pin.
7. **Most powerful starter made.**

We have some territory still open in Illinois for distributors.



Note improved appearance of Ford car with the Dayton Starter mounted on front.

Write for Our Proposition

THE DAYTON ELECTRICAL MFG. CO. DAYTON, OHIO, U. S. A.



YOUR profits on "Crowe" Mechanical Fan Belts will be greater than on ordinary Fan Belts

THESE belts not only offer "full value" at the retail price, but the trade price affords you a liberal margin of profit. Large scale production and the efficient operation of our modern factory makes this condition possible.

FOR CARS, TRACTORS AND TRUCKS

Crowe Mechanical Fan Belts are made in a variety of styles, for all automotive purposes. **Adjustable, Efficient, Silent, Strong.** Steel and wire links produce strength and durability, while sole leather blocks provide noiseless friction. These belts are not affected by heat, oil, or water, and will not slip, stretch or break.

PRICES:

| | |
|--|--------|
| Standard Ford Sizes, adjustable to all models, each..... | \$1.25 |
| Flat Type, any length or width desired, per foot..... | .60 |
| V Type, any length or width desired, per foot..... | 1.20 |

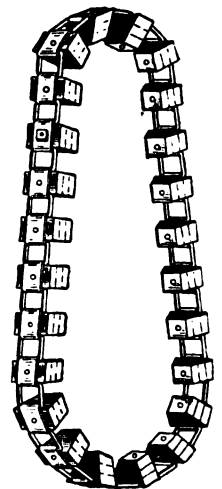
ATTRACTIVE PROPOSITION TO DEALERS: Profits are much greater than on ordinary fan belts, and the ultimate purchaser is sure to be satisfied.

Write or wire us for details of our Sales Co-Operation Policy

THE MECHANICAL BELT COMPANY

2014 Frederick Avenue

ST. JOSEPH, MO.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Kansas Dealer Has New Plan for Shipment of Automobiles

Method is to Install Double Decking System in Freight Cars so More Vehicles Can be Carried

J. C. Youngblood of the J. C. Youngblood Auto Co., Oakland and Overland dealer at Atwood, Kans., has a novel and highly effective method of loading autos on freight cars for shipment. Six autos to a car and in double-deck formation is the idea and this is aptly portrayed in the accompanying illustrations. The Youngblood scheme also includes hydraulic and electric power, time-saving in the loading process, a minimum of expense in loading, as well as economy in the use of space in the car. The machinery is covered by letters patent.

A double decking system is installed in an ordinary freight car, the same becoming a permanent part of the car. The equipment does not interfere with the loading of other and miscellaneous commodities. The upper deck can be raised and lowered. For loading, the upper deck is lowered until it rests on the floor of the car, when the autos may be rolled in until the deck is entirely occupied. It is then raised and

the floor load of autos rolled in, thus filling the car completely. Mr. Youngblood states that the system is so worked out that one man can load or unload a car.

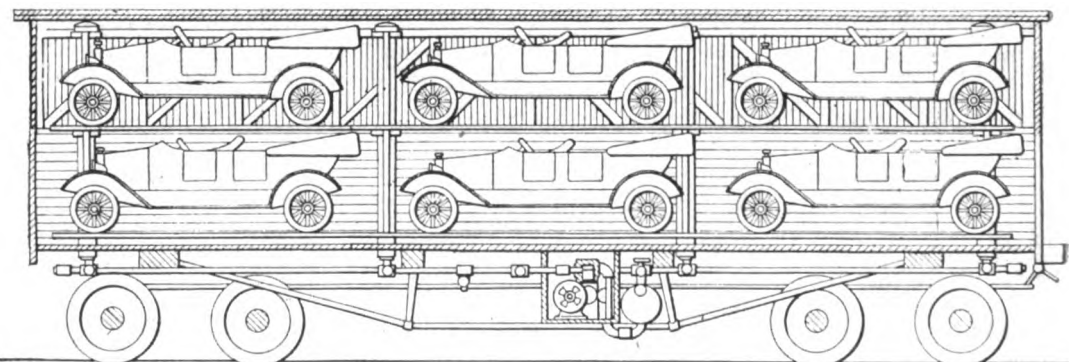
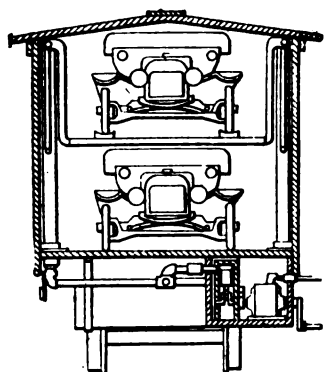
Hydraulic cylinders and pistons are employed to raise and lower the upper deck. The cylinders, which are vertical, are placed at suitable intervals along the sides of the car, each cylinder on one side having its corresponding cylinder on the opposite side. The piston rods extend upward and carry guides which extend through slots cut in the cylinders above the upper limit of piston travel. The upper ends of the piston rods carry hangers, and to these hangers are secured crossbeams, reaching across the car from hanger to hanger. Upon the crossbeams are laid longitudinal tracks for the wheels of the automobiles or a solid floor, as may be desired.

A gear-driven pump is hung under the car, connected up with an electric motor. Pipes carry oil from the pump to the lift-

ing cylinders. The current for the motor may be obtained from an outside source and if no current is available the pump can be operated by hand, a crank and a shaft for the purpose being part of the equipment. The method of operating the system is to load the upper deck while it rests upon the floor, after which the electric motor is started and oil pumped to the cylinders, forcing up the pistons and, of course, the entire upper floor structure. When the proper height has been reached the motor is stopped, automatic valves preventing a return flow of the oil. Pins are passed through the piston rods and guides, holding the floor in place even though there might be a leakage of oil.

When the upper deck is to be unloaded the valves are opened, after the retaining pins have been removed, and the receding oil permits the dropping of the pistons and of the upper deck with its load. A tank is provided which carries the oil when the cylinders are empty and also furnishes an extra supply to make up for leakage.

According to Mr. Youngblood, his invention will save from \$20 to \$40 per carload of automobiles, due mainly to the elimination of the building of temporary double decks.



CALENDAR OF EVENTS.

Mar. 15-22—Boston, Mass.—Show.
Mar. 15-22—Harrisburg, Pa.—Show.
Mar. 17-22—Great Falls, Mont.—Show.
Mar. 17-22—Philadelphia, Pa.—Truck Show.
Mar. 17-22—Trenton, N. J.—Show.
Mar. 19-22—St. Joseph, Mo.—Show.
Mar. 19-22—Norfolk, Neb.—Show.
Mar. 22-29—Brooklyn, N. Y.—Car Show.
Mar. 22-29—Pittsburgh, Pa.—Show.
Mar. 24-29—Utica, N. Y.—Show.
Mar. 24-29—New Orleans, La.—Show.
Mar. 26-29—Watertown, N. Y.—Show.
Apr. 1-5—Brooklyn, N. Y.—Truck Show.
Apr. 5-12—Bridgeton, N. J.—Show.
May 10-17—Bristol, Va.—Tenn.—Automotive Show.

AUTOMOTIVE NEWS NOTES.

Henri Du Jardin has been appointed special representative for H. G. Paro, the Chicago distributor of accessories and garage equipment.

C. A. Olfs has been made Michigan representative for the Stewart Mfg. Corporation of Chicago. A sales office has been opened at 1509 Kresge Bldg., Detroit.

Fred D. Williams has been appointed general manager of the L. H. Gilmer Co. at Philadelphia. He was formerly head of the power specialties department of the H. W. Johns-Manville Co.

J. J. Buzzell became advertising manager of the Hyatt Roller Bearing Co., Detroit, February 1, succeeding W. E. Biggers, who had resigned.

Gilbert U. Radoye has become associated with the Haynes Automobile Co., as ad-

vertising manager and assistant sales manager. He has been affiliated with the advertising division of the Hudson Motor Car company, the Packard Motor Car Company, where he handled carriage sales promotion, and with the Nordyke and Marmon Company on their advertising staff.

Graham W. Brogan has been appointed advertising manager of the Black & Decker Mfg. Co., Baltimore, Md. He formerly filled a similar post with the Deussen Motors Corporation.

D. P. Cartwright has been appointed manager of the North East Electric Company's New York branch. He succeeded R. J. Hardacker, who has taken charge of the Chicago branch.

R. Garland Ames has been appointed Chicago district manager for the Black & Decker Mfg. Co., Baltimore, Md. Mr. Ames was with the Edward A. Cassidy Company of New York for many years.

KENNEDY Auto Storage Covers

furnish efficient protection for cars in dead storage. They are made of strong, heavy paper, properly reinforced, and in standard sizes to fit any car.

Made only by

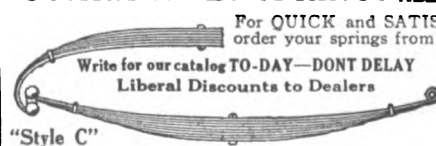
THE KENNEDY CAR LINER & BAG CO., Shelbyville, Ind.

GUARANTEED SPRINGS

CARRIED IN STOCK FOR ALL MAKES OF CARS

For QUICK and SATISFACTORY SERVICE order your springs from

Write for our catalog TO-DAY—DON'T DELAY
Liberal Discounts to Dealers



AUTO SPRING
REPAIR CO.

1331 W. Jackson Blvd.
CHICAGO, ILL.



Roller Bearings

for FORD and CHEVROLET
FRONT WHEELS



The success of your business is built on the good will of your trade.
Insure both by selling

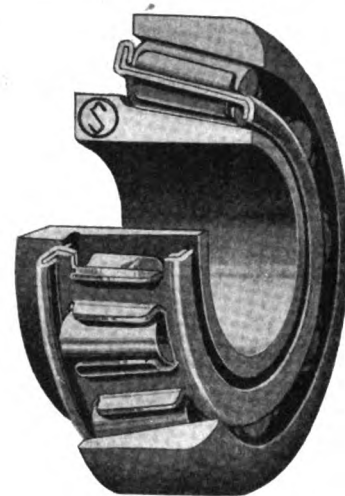
F. W. S. Roller Bearings

F. W. S. Rollers are always kept in proper position, without wear or friction, by the double retainer, an exclusive F. W. S. feature.

F. W. S. material and workmanship is the best that can be produced. Rings, cones and rollers are micro ground to absolute uniformity. Every roller carries its own share of the load and no more, consequently the wear is equal at all points and broken rollers simply do not occur. Garages, repair shops and accessory dealers should investigate this proposition immediately.

F. W. STEWART

1402 Michigan Ave.
Chicago, Ill.



CYLINDER RE-BORING

A Marvel Will Ring the Cash Register for Real Profits

Because the MARVEL is in a class by itself, as a superior Re-boring Machine. It will repay you a handsome dividend on a very modest investment because it creates a new department for your shop that your customers will be quick to appreciate.

The MARVEL is Automatic—You simply place the cylinder block in proper adjustment and the MARVEL does the rest. It permits the operator to go about other work. At the proper time the Automatic Stop will release the feed. The MARVEL is Power Driven and will do a job from five to twenty times faster than a grinder. It has a Friction Disc Feed ranging from 26 to 120 threads to the inch. The MARVEL will accommodate any gas engine cylinder from a motorcycle to a tractor.

Don't wait until your competitor has the re-boring business. You get a MARVEL and you get the work. Write at once for descriptive literature and prices.



We furnish the well known MARCO OVERSIZE PISTONS to dealers who install a MARVEL NO. 5 RE-BORING MACHINE. This is the biggest profit maker that ever went into a shop.



**MARVEL
MACHINERY
COMPANY**

1307 So. Third St.
MINNEAPOLIS, MINN.



We furnish you dealer helps that bring home the business—Signs for your window, ads for your local paper, letters for your prospective customers, etc.



Have you a "Piston Ring Primer" in your pocket? It has 16 pages of valuable information. Free to you.

Ever-Tyte Bill

Says:- Did you ever stop to think that many a bizness has gone busted

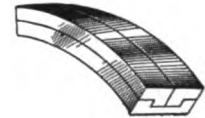
because the Boss has got use to settin on a soft piller in his eazy chair, takin everybodys word for everything insted of seein for hisself? It's a fack.

Human natur is human natur an we're all alike is some respects. We all likes to duck the jobs that looks hard to us. An the funny thing about it all is that anything thats worth havin makes you use your noodle and elbow grease to get it.

Gettin back to a pleasant subject—these here **Ever-Tyte** Piston Rings are the fine little boosters — they've helped many a shops repertation, because they satersfy the man who runs the car—I know—I've been there.

A lot of guys workin around ottermobiles is married to single piece rings—why?—Cause their eazy to put on—

but supposin these same guys has a ring thats locked into one piece, as eazy to install as any ring, but does the bizness three times as good—thats wot the new **Ever-Tyte is—Three-Locked-into-One**—I'll tell the world its got em all skinned to death.



RIGHT ANGLE INTERLOCK

THE EVER TIGHT PISTON RING CO.

1609 KINGSLAND AVENUE

AG&AD 2-19

SAINT LOUIS MISSOURI

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

Retails for \$9.00 complete.

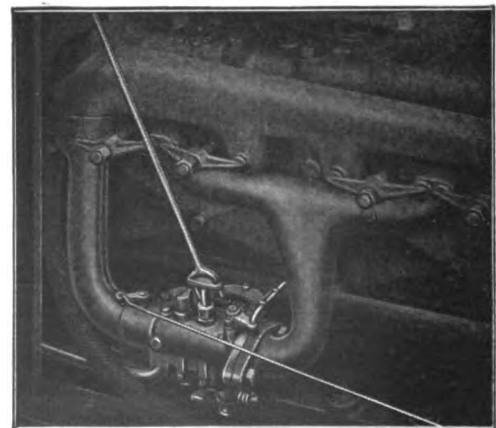
MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Overland and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY

FLINT, MICHIGAN, U. S. A.



MOTOR AGE

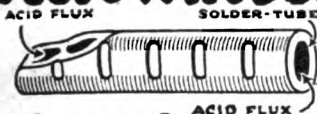
October 31, 1918

EDITORIAL



THE radiator was washed out carefully with a solution of soda, which reveals any leaks that exist. These then should be soldered. Many anti-freeze substances attack dirt and if your radiator started to leak last winter after you added the anti-freeze, it was because you failed to clean the radiator and repair the leaks. The anti-freeze told you that leaks existed. You probably thought the anti-freeze was eating away the metal. Follow the maker's directions this winter and you will play safe.

KESTER Acid Core Wire Solder



is the best for repairing
"Radiator Leaks"

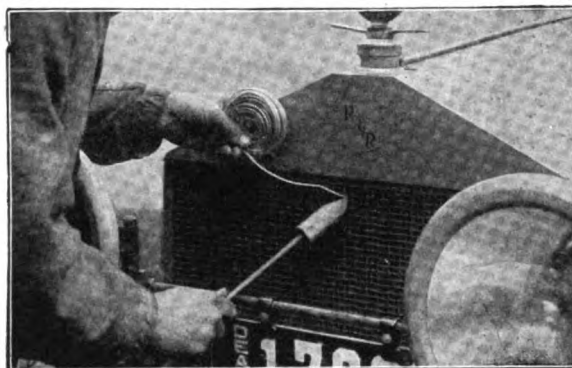
"Motor Age" in an editorial recommends that Radiator Leaks should be soldered.

Repairing those leaky radiators is done quickly, easily and permanently, with KESTER ACID-CORE WIRE SOLDER. You don't have the tedious work of applying a separate acid or flux, as the acid soldering flux is within the solder tube and ready to use. Sold on 1, 5 and 10 lb. spools, and in 1 lb. coils in cartons. Order from your jobber or direct.

Send for free sample.



Chicago Solder Co.
CHICAGO - U.S.A.



QUALITY **ROSE TIRE PUMPS** SERVICE
ROSE products satisfy service pleases
OVER 1,000,000 IN USE



ASK YOUR JOBBER
J. A. Haney & Co
Hastings Neb
MFGRS



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

New tires from old with 5000 "more miles"

Your customers can get another 5000 miles out of their old tires and you can make a good profit on each job if you will get in touch with us.

We "remake" old tires by a process that gives them 5000 or more additional miles. Even if they are sand-blistered, blown out, punctured, or rim cut, we make them like new. With new tires likely to be expensive for some time, this service should appeal to your customers strongly. Write today for full particulars and prices.

**LEO M^cDANIEL
RUBBER COMPANY**
804 COMMERCIAL AVE.
CAIRO - ILL



Smooth as the flight of the birds



going North for the Summer is the progress of the Ford equipped with

W. & C. Shock Absorbers

The 200,000 Fords equipped with these Shock Absorbers is adequate proof of their superiority. There are thousands sold every month.

DEALERS: Every Ford owner is a likely prospect for W. & C. Shock Absorbers. The expenditure of \$10.00 adds many times that amount to the life of the car, to say nothing of the comfort afforded.

The margin of profit to you is unusually liberal.

Write today for our dealer offer.

P. H. WEBBER CO.
Hoopestown, Ill.



GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company
1002 Washington Boulevard
Chicago, Illinois



Pondelick Brothers

will pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrinding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

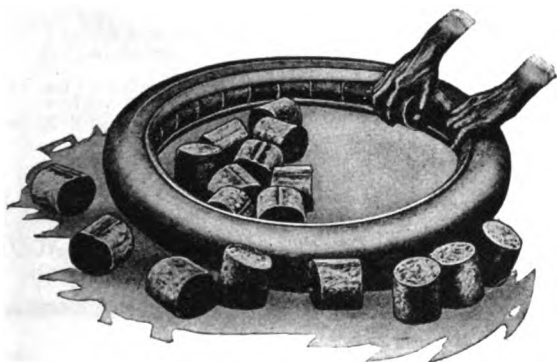
How You Can Conserve with National Rubber Tire Filler

More Miles Per Tire—Less Tires to Buy and No Buying of Tubes at All.

During the period of the War we learned to conserve in many ways—Food, Fuel, Farm-stuffs, Man-power and Transportation Facilities were first. The use of

National Rubber Tire Filler

offers you a medium for continuing to conserve without any sacrifice whatever.



Motorists Have No Tire Trouble Who Ride on This Perfect Substitute for Air

Rim-cut-proof, blowout-proof, puncture-proof tires are now a reality. Motoring is now freed from the shackles of tire trouble, and is made safe, comfortable and enjoyable.

National Rubber Tire Filler replaces the inner tube. It has all the resiliency of an air-filled tire with none of its disadvantages. It lasts indefinitely—40,000 miles or more. It has been in use for seven years and has conclusively proven its superiority and economy over air-filled tires. Our factory taxed to capacity is proof positive of its great popularity.

It rides as easy as air.
It cannot puncture or blowout.
It can be used on all style tires.
It doubles tire mileage.
It is easily installed.
It stimulates motoring.

National Rubber Filler Company
210 College Street Midlothian, Texas



Badger

SLIP ROOFS

A wonder re-cover for Auto Tops. Great improvement. Greatest value ever offered. Surpasses anything on the market. Wins every motorist's preference. Most profitable dealer can handle. For practically all makes of cars.

COMPLETE—everything. Ready to put on—and put on in a few minutes by anyone. Guaranteed fit.

Prices that will make you wonder how we can give so much sound value for the money. Investigate. Get the facts. Get the business. Write now for particulars and prices. Also catalog of

Badger Seat Covers

Choicest selection of beautiful, durable fabrics. Tailored fit—guaranteed. For all makes of cars. A quality line at amazing money saving cost.

Back Curtains

With Plate Glass Windows

Pierce Arrow effect! Eliminate unsightly celluloid. Add big beauty value to any car. Reasonable price makes them rapid sellers.

Tire Covers

The famous Badger Quality. Known world over for superior merit. Most serviceable materials procurable for tire protection. All sizes—at quick-selling prices.

Get a line on the entire Badger line. Every article a trade increaser. All dependable—all profitable—for all dealers.

Write today!

Wisconsin Auto Top Co.

2 Main Street

RACINE, WIS.

May we show how
profits can be
increased.

STORM

CYLINDER RE-
BORING MACHINES



Storm Cylinder
Reboring Machine

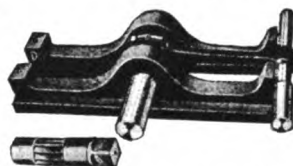
Of course you are inter-
ested in getting the
maximum profits out of your
repair business. You owe it
to yourself to investigate a
line of equipment that is
saving time, labor and money
in hundreds of repair shops.

Our line includes the
STORM Cylinder Reboring Machines
STORM Piston Vise
STORM Valve Port Renewing Outfit
STORM Connecting Rod Bearing
Reamer, Jig and Straightening Gauge

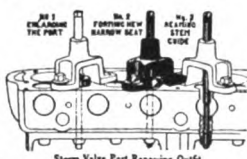
Write today for catalogue
giving us your jobber's name

STORM MFG CO.

1714 4th St. THOMPSON, IOWA



The Storm Connecting Rod Bearing
Reamer, Jig and Straightening Gauge

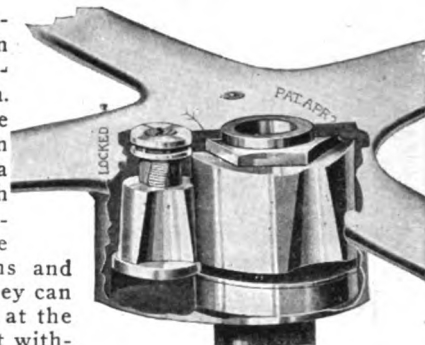


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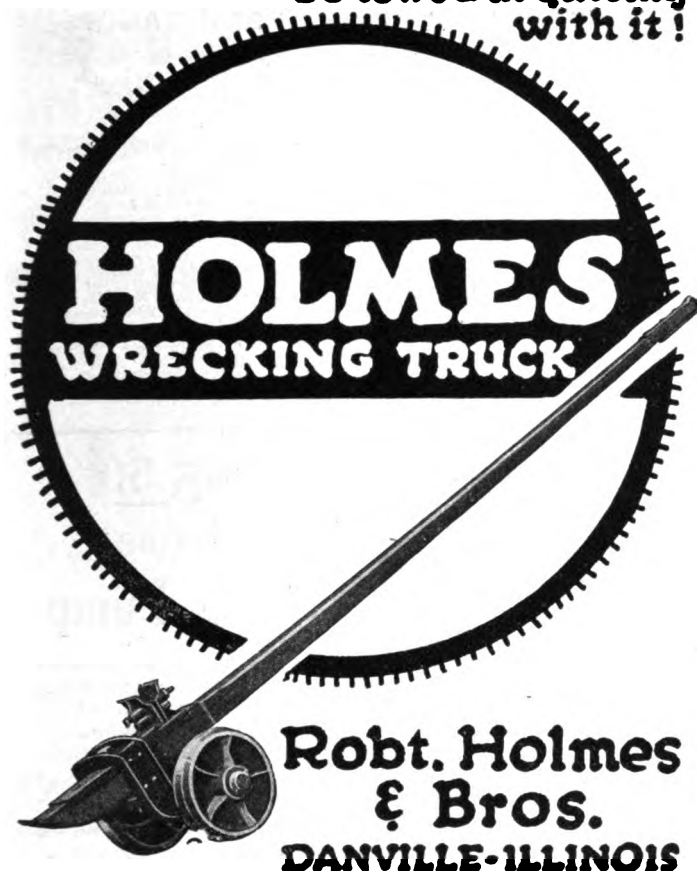
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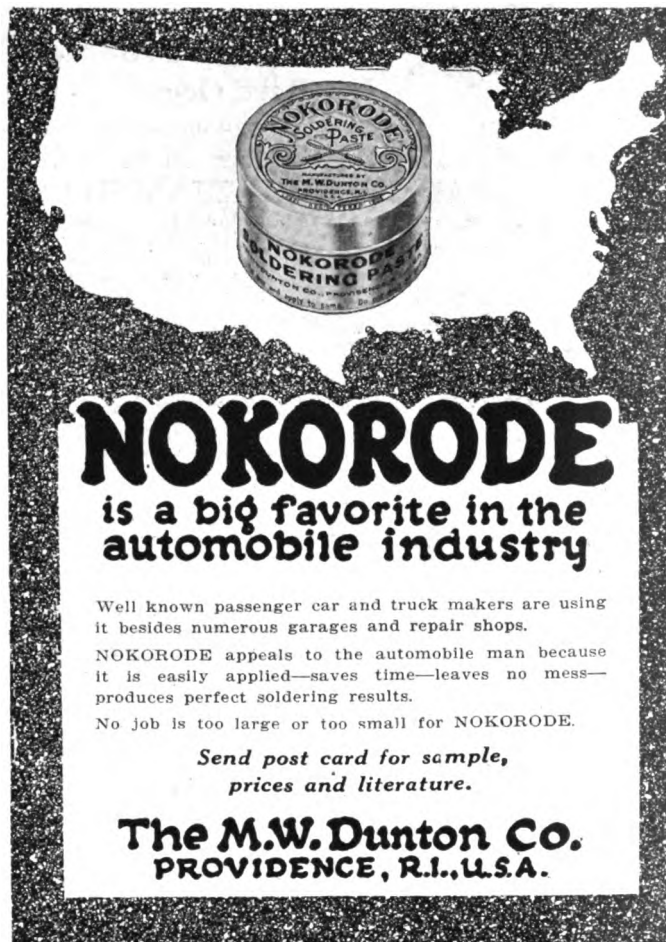
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WEARS LIKE LEATHER

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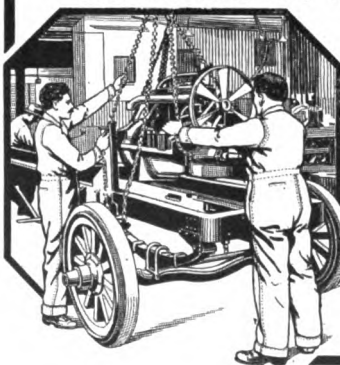
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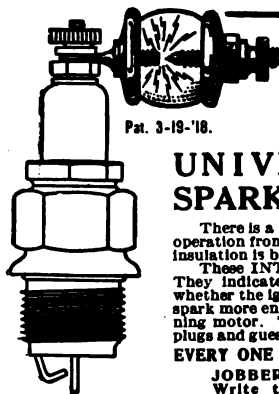


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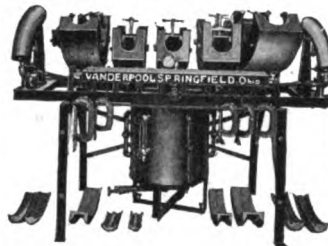
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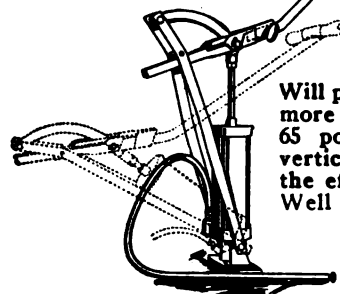
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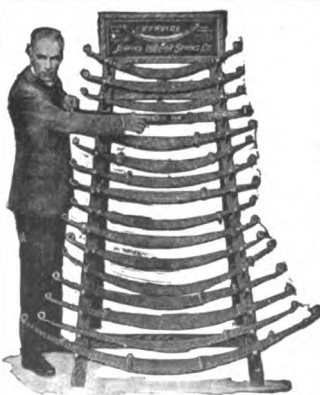
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Hydraulic Arbor Presses

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We make
many sizes
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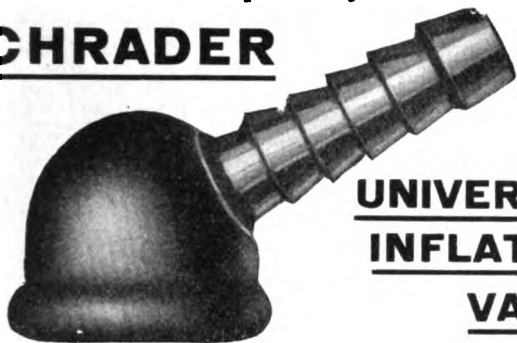
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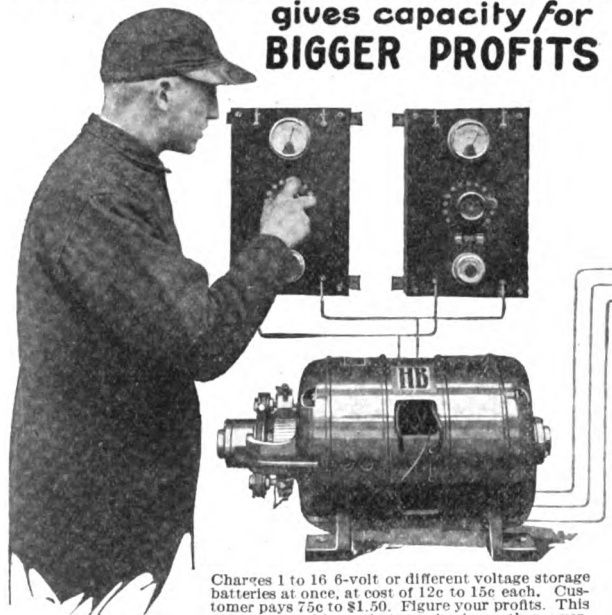
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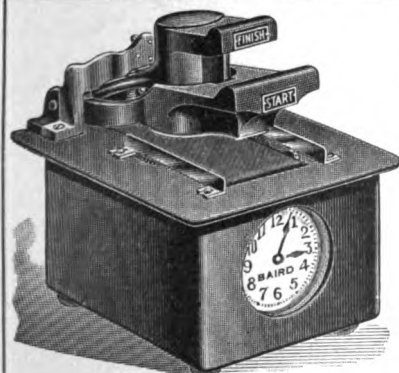
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WORK, MATERIAL and
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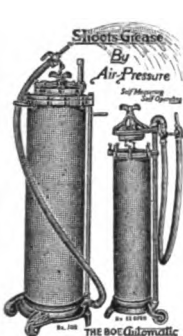
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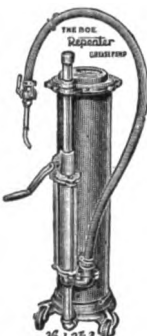
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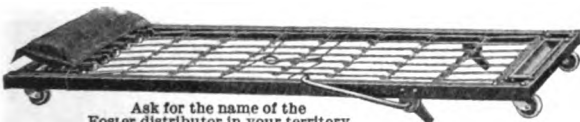


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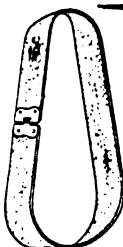
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PUMPS

The W. H. Howell Co., 10 State St., Geneva, Ill. (Jensen Tire Pump.)
J. H. Haney & Co., Hastings, Neb.

RADIATORS

Detroit Auto Radiator Co., 180 Fifth St., Milwaukee, Wis.
Hooven Radiator Co., 519 Monroe St., Chicago.

REPLACEMENT COILS AND RESISTANCE UNITS

New York Coil Co., 338 Pearl St., New York City.

SHOCK ABSORBERS

W. S. Burgess Mfg. Co., 1323 S. Michigan Ave., Chicago.
Philip H. Webber & Co., Hoopeston, Ill. (W & C.)

SIGNS

Commonwealth Edison Co., 72 W. Adams St., Chicago, Ill. (Federal Electric Signs.)
Federal Sign System, Lake & Desplaines Sta., Chicago.
Flexlume Sign Co., Niagara St., Buffalo, N. Y.

SOLDER

Chicago Solder Co., 218 No. Union Ave., Chicago, Ill.

SOLDERING FLUX

M. W. Duntun Company, Providence, R. I.

SPARK PLUGS

Tungsten Mfg. Co., Marshalltown, Ia.

SPARK PLUG INTENSIFIERS

Universal Mfg. & Sales Co., 552 W. Harrison St., Chicago.

SPRINGS

Auto Spring Repair Co., 1331 Jackson Blvd., Chicago.
Garden City Spring Works, 2800 Archer Ave., Chicago.
Harvey Spring & Forging Co., Racine, Wis.
Jenkins Vulcan Spring Co., 1403 Chestnut St., St. Louis.
New Era Spring and Specialty Co., Grand Rapids, Mich.

TESTING INSTRUMENTS

Jewell Electrical Instrument Co., 1650 Walnut St., Chicago.
Phillips Engineering Co., Dayton, Ohio.
Weston Electrical Instrument Company, Newark, N. J.

TIMING DEVICES

Reid Equipment Co., 324 W. Ohio St., Chicago.
Calculagraph Co., 30 Church St., New York.

TIRES

Kimball Tire & Rubber Co., 1469 S. Michigan Ave., Chicago.
American Accessories Co., Cincinnati, O.
Leo McDaniel Rubber Co., Cairo, Ill.

TIRE REPAIR EQUIPMENT

Akron Rubber Mold & Machine Co., 947 Sweltzer Ave., Akron, Ohio.
C. A. Shaler Co., Waupun, Wis.
Zinke Co., 1323 So. Michigan Ave., Chicago.

TIRE RENEWING

Leo McDaniel Rubber Co., 804 Commercial Ave., Cairo, Ill.

TRANSMISSIONS

Tractor-Train Co., 1344 S. Wall St., Los Angeles, Cal.

TRUCK UNITS

Dearborn Truck Co., 2015 S. Michigan Ave., Chicago.

VALVES

Romort Mfg. Co., Oakfield, Wis.
A. Schrader's Son, Inc., 783-798 Atlantic Ave., Brooklyn, N. Y. (Automatic Inflating Valve)

VAPOR PRIMERS

Jorgensen Mfg. Co., Waupaca, Wis.

VALVE REMOVERS

Buffum Tool Co., Louisiana, Mo.

VULCANIZERS

C. A. Shaler Co., 353 Fourth St., Waupun, Wis.
Vanderpool Vulcanizing Co., Springfield, Ohio.

WELDING APPARATUS

Permo Supply Co., Omaha, Neb.
St. Paul Welding & Mfg. Co., 173 W. 3rd St., St. Paul, Minn.

WRECKING TRUCKS

Robt. Holmes & Bro., Danville, Ill.

WRENCHES

The Graham Roller Bearing Co., Coudersport, Pa.

Index to Advertisements

| A | | J | |
|--------------------------------------|----|-----------------------------------|--------|
| Advance Automobile Accessories Corp. | 3 | Jenkins Vulcan Spring Co. | 56 |
| Akron Rubber Mold & Machine Co. | 25 | Jewell Electrical Instrument Co. | 45 |
| American Accessories Co. | 59 | | |
| American Bolt & Screw Case Co. | 57 | | |
| American Machine Products Co. | 55 | | |
| American Technical Society | — | | |
| Aske Automatic Voltage Regulator Co. | — | | |
| Atlas Auto Supply Co. | 3 | | |
| Auto Cape Top Co. | 58 | | |
| Auto Engine Works | 58 | | |
| Auto Parts Co. | 48 | | |
| Auto Spring Repair Co. | 58 | | |
| Auto Wrecking Co. | 58 | | |
| B | | K | |
| Baird Equipment Co. | 57 | Kennedy Car Liner & Bag Co. | 48 |
| Bermo Co., A. J. | 56 | Kimball Tire & Rubber Co. | — |
| B. & M. Mfg. Co. | — | | |
| Boe Co., H. M. | 59 | | |
| Brunner Mfg. Co. | 35 | | |
| Buettner Co., Chas. H. | 59 | | |
| Butler Mfg. Co. | 53 | | |
| Buffum Tool Co. | — | | |
| Burgess Mfg. Co., W. S. | 27 | | |
| C | | L | |
| Calculagraph Co. | 61 | Lawrence & Co., L. | 58 |
| Cassidy Co., Edward A. | — | Lourie Mfg. Co. | 56 |
| Inside Back Cover | — | | |
| Catelain, Andre G. | 58 | | |
| Chicago Baling Press Co. | 59 | | |
| Chicago Solder Co. | 51 | | |
| Commonwealth Edison Co. | 41 | | |
| Curtis Pneumatic Machinery Co. | 25 | | |
| D | | M | |
| Dayton Electrical Mfg. Co. | 47 | McDaniel Rubber Co., Leo. | 57 |
| Dearborn Truck Co. | — | Malbohm Wagon Co. | 52 and |
| Defender Auto Lock Co. | — | Marmon Chicago Co. | — |
| Denby Motor Truck Co. | 7 | Marvel Carburetor Co. | 50 |
| Detroit Auto Radiator Co. | 58 | Marvel Machinery Co. | 49 |
| Dunton Co., M. W. | 55 | Mechanical Belt Co. | 47 |
| E | | Miami Trailer Co. | 4 |
| Eccolene Company | — | | |
| Elgin Motor Car Corp. | — | | |
| Ever-Tight Piston Ring Co. | 50 | | |
| F | | N | |
| Federal Sign System (Electric) | 41 | National Cash Register Co. | 43 |
| Flexlume Sign Co. (Back Cover) | — | National Rubber Filler Co. | 53 |
| Forbes, J. P. | — | National Wire Wheel Works | 5 |
| Foster Bros. Mfg. Co. | 59 | New Era Spring and Specialty Co. | 56 |
| Franklin Mfg. Co. | 55 | New York Coll. Co. | — |
| G | | New York Lubricating Oil Co. | 54 |
| Ganschow Co., William | 52 | No-Leak-O Piston Ring Co. | 59 |
| Garden City Spring Works | 61 | Norma Company of America, The | 6 |
| Gill Mfg. Co. | — | | |
| Globe Mfg. Co. | 42 | | |
| Graham Roller Bearing Co. | — | | |
| The | 57 | | |
| Greer College of Motoring | 58 | | |
| H | | P | |
| Haney & Co., J. H. | 51 | Paro, H. G., Co. | 4 |
| Hartson & Co., Inc., Thos. J. | — | Phillips Engineering Co. | 56 |
| Harvey Spring & Forging Co. | 37 | Ponderick Bros. | 52 |
| Hobart Bros. | 57 | Pruyn Ball Bearing Works | — |
| Hoffman Mfg. Co., Andrew | 61 | | |
| Holmes & Bros., Inc., Robert | 55 | | |
| Hooven Radiator Co. | — | | |
| Howell Co., The W. H. | 56 | | |
| I | | R | |
| Inland Machine Works | — | Reliance Co. | 54 |
| Inside Front Cover | — | Romort Mfg. Co. | 39 |
| J | | S | |
| | | Shaler Co., C. A. | — |
| | | Front Cover and | 33 |
| | | Schrader's Son, Inc., A. | 57 |
| | | Spencer's Sons, I. S. | 59 |
| | | Sprague Mfg. Co., E. H. | — |
| | | Standard Auto Salvage Co. | 58 |
| | | States Chemical Co. | — |
| | | Stewart, F. W. | 49 |
| | | Storm Mfg. Co. | 54 |
| | | Sunderland Machinery & Supply Co. | 58 |
| K | | T | |
| | | Tractor-Train Co. | — |
| | | Tungsten Mfg. Co. | — |
| L | | U | |
| | | Universal Battery Co. | 45 |
| | | Universal Mfg. & Sales Co. | 56 |
| | | U. S. Air Compressor Co. | 31 |
| M | | V | |
| | | Vanderpool Vulcanizing Co. | 56 |
| | | Visible Gasoline Dispenser Co. | — |
| N | | W | |
| | | Wagner Specialty Co. | 59 |
| | | Warshawsky & Co. | 58 |
| | | Waxit Mfg. Co. | 29 |
| | | Webber & Co., P. H. | 52 |
| | | Weston Electrical Instrument Co. | 59 |
| | | Wisconsin Auto Top Co. | 53 |
| O | | Z | |
| | | Zinke Co. | 39 |

AUTOMOBILE SPRINGS
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago

\$16 Makes the Ford Carry Real Loads



(PATENTED)
Showing the Alford Auxiliary Springs properly attached.

ALFORD AUXILIARY SPRING ATTACHMENTS

A Quick Seller to All who Use Fords for Commercial Purposes

This attachment, shown above, makes it possible to transform a Ford into a serviceable truck at a much lower cost than has hitherto been possible. The auxiliary springs furnish additional spring tension and afford more mileage by absorbing the road shocks that the tires and rear axles ordinarily have to stand. They also prevent the dangerous swinging and tipping of the body.

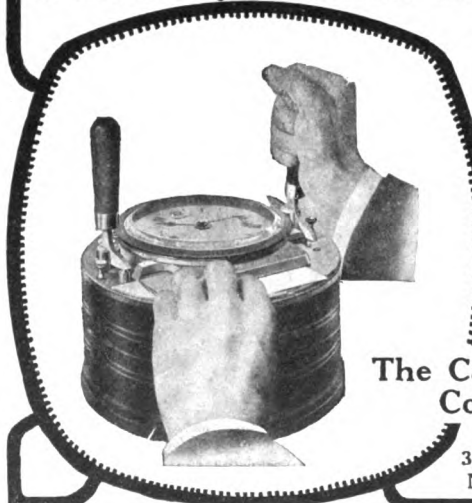
DEALERS—There are many prospects for these attachments in your locality. Write today for particulars.

ANDREW HOFFMAN MFG. CO.
5034-36-38 So. State St. Chicago, Ill.

PUT YOUR Shop on a

CALCULAGRAPH

Basis and you'll make more money



Guessing at repair costs is bad business. You either over-charge or under-charge.

The CALCULAGRAPH computes and prints Elapsed Time — the correct basis for repair charges. Stops losses — ends disputes.

Ask for Booklet No. 10.

The Calculagraph Company

30 Church Street
New York City

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



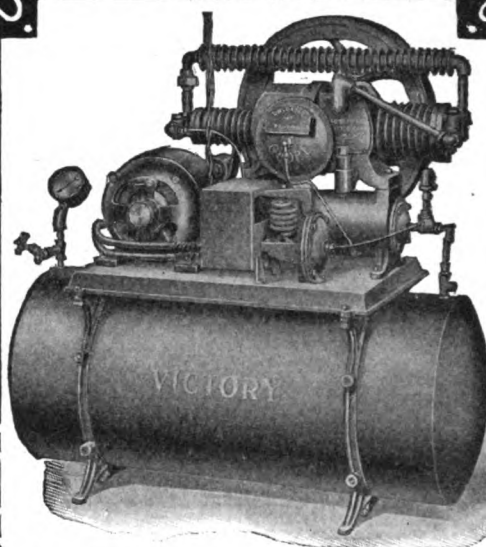
and so it is apropos
for us to name our
new air compressors
"THE VICTORY"

For years GLOBE AIR COMPRESSORS have been making friends by making good. They have come to be known for their dependability and good service.

If for no other reason, we would call our newest air compressors "The Victory" because in many features they are a progressive departure—they are the latest thing in air compressors.

If you expect to buy an air compressor this year, investigate these new "Victory" models—they'll interest you. Shall we send you descriptive literature?

GLOBE MFG. COMPANY
Battle Creek, Michigan



VICTORY—Ace of Aces
among Garage Compressors

Automatic Motor Drive Compressor unit, substantially mounted on steel air storage tank, beautifully finished, and making the most compact, attractive and practical automatic air plant.

Unequalled for free air stations, garages, vulcanizing shops, and any other service, requiring a dependable supply of compressed air always on tap.

VICTORY-PORTABLE

Complete Automatic [Motor Drive Unit]

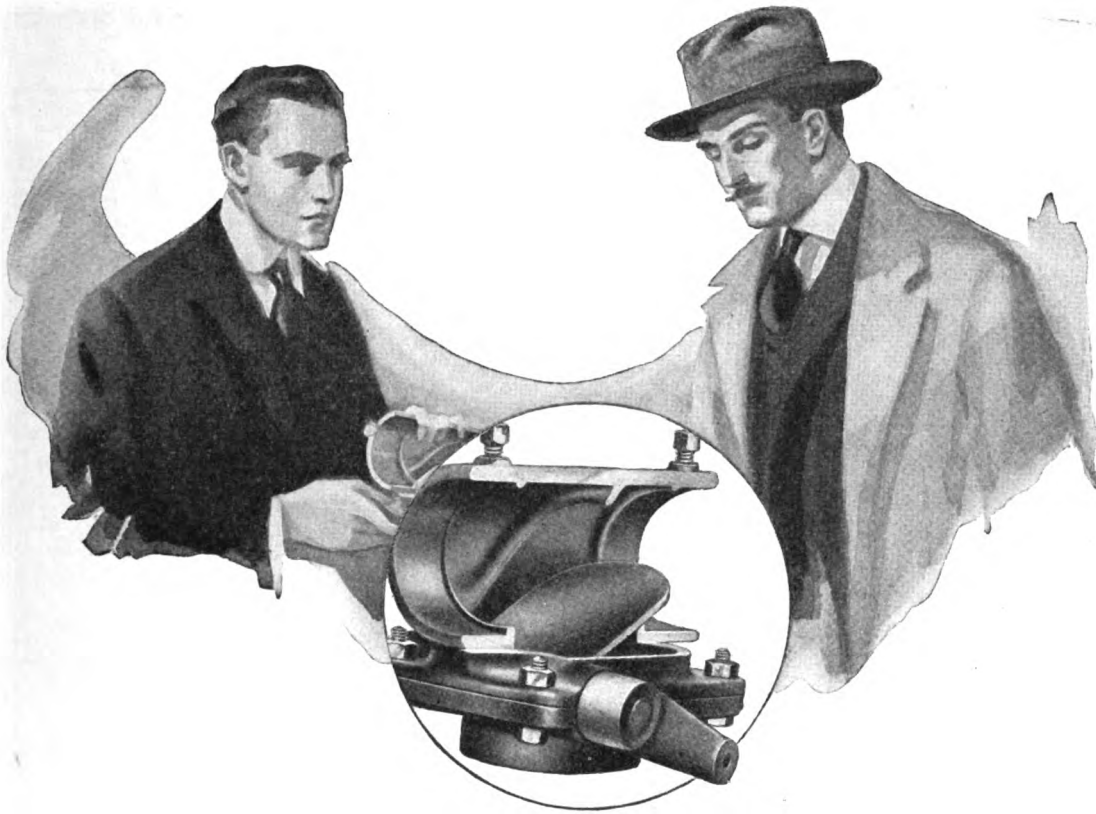
Except when being moved about is virtually a stationary outfit resting on four feet.

Perfect stability and freedom from vibration is obtained when compressor is in use.

By depressing handles, which latch automatically, wheels are lowered and feet raised, which permits removal anywhere, even in smallest space. (Specifications similar to the Victory Stationary Equipment.)



GLOBE



“Nip trouble in the bud”

Keep your motor clean

CARBON in your engine costs power and money. Keep it clean and “nip trouble in the bud”.

Relieve your motor whenever you can of the necessity of forcing exhaust gases through a muffling device.

When you step on the G-P Muffler Cut-Out you literally *blow* the carbon right out of your engine. The exhaust is cleaned and carbon accumula-

tions are forced out of the manifold. It eliminates back pressure.

A G-P Muffler Cut-Out enables you to tell in a second when you are wasting power, gas and money. It makes for economy.

Sales Department

EDWARD A. CASSIDY CO., Inc.

Madison Ave. at 40th St., New York City

Manufacturers: THE G. PIEL CO., Inc.

Long Island City, N. Y.

The G-P Muffler Cut-Out

“Tells the motor’s secrets”



Day and Night Signs That Pay Big Profits

One reason why Oplex signs are paying out so well for automobile sales agencies and garage men is because they are day signs as well as night signs—raised snow white letters, standing out from a dark background, the most striking day signs on the street; at night each letter shining forth a solid blaze of light, its outline unbroken.

They cannot miss your sign if it is an Oplex.

It will pay for itself quickly in direct sales. All the general publicity is clear profit.

The question is not: Can you afford an Oplex sign? Can you afford to be without one?

If you will give us an idea of your needs we shall be pleased to send you a sketch showing how your sign will look and the Flexlume booklet, "Twenty-four Hours a Day."

The Flexlume Sign Co. Niagara St. and Potomac Ave.
Buffalo, N. Y.

Pacific Coast Distributors:
Electric Products Corp.
Los Angeles, Cal.

Canadian Distributors:
The Flexlume Sign Co., Ltd.
Toronto, Can.

AMERICAN GARAGE & AUTO DEALER



Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

APRIL

1919

Vol. 18—No. 4
10 Cents the Copy
\$1.00 Per Year

**COMPLETE
OUTFIT
\$700**



Makes 4 Repairs in 5 Minutes

To introduce this wonderful new Shaler Garage Vulcanizer---we will send *Absolutely Free*, with each outfit---an assorted supply of Shaler Patch-&Heat Units; that will make repairs enough to more than pay for the outfit.

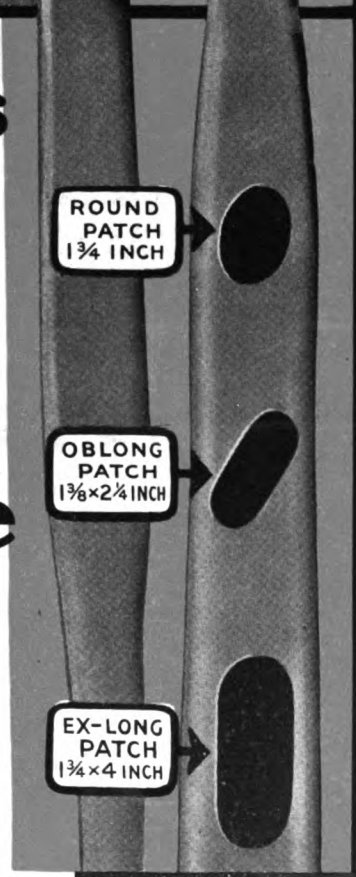
This new gang vulcanizer was designed especially to meet the demand from Garages and Repair Shops for a large capacity, quick action, dependable vulcanizer, that uses the convenient Shaler Patch-&Heat Units. These handy units are very popular for making tube repairs. Over 10,000,000 punctures were repaired with them last year. No other method is so quick, safe, convenient and satisfactory.

SHALER 5-Minute Garage Vulcanizer

You can obtain garage size, Large Packages of Shaler Patch-&Heat Units from your jobber, at prices so low as to make this the cheapest method of vulcanizing. There is no danger—no gasoline, no blaze, no flame, no trouble, no waiting to heat vulcanizer.

Write Quick—or Ask Your Jobber

Our Low List Price \$10 is subject to 30% trade discount, making the Net Price to you only \$7—and with the outfit we send you Free Patches enough to more than pay for it, so that the outfit costs you practically nothing. Write for booklet.



C. A. SHALER COMPANY
353 Fourth Street
WAUPUN, WIS.



Inland service everywhere.

Because of the tremendous and constantly increasing demand for Inland Piston Rings, jobbers everywhere keep a full stock of Inlands in all standard sizes and in the over-sizes most usually called for.

Every dot on the map shows the location of jobbers who stock Inlands. Wherever a dealer may be, he can get quick and nearby service on Inlands.

Inland sales are now on a basis of millions per annum. Three factories are required to keep up with the demand.

The Inland patented Spiral Cut solved the problem of making a *one-piece* ring *completely* gas-tight. The success of the Inland is due to sheer mechanical superiority over any other type of piston ring—a superiority that is recognized the world over.

Get a stock of Inlands from your jobber now.

Inland Machine Works, 1645 Locust St., St. Louis, Mo., U. S. A.

INLAND

If your Ford brake isn't sure

—if you have that anxious feeling that maybe it's going to hold and maybe it isn't—

You need

CORK ADVANCE INSERT

Transmission-Brake Lining on your Ford

Advance Cork Insert will give you a **SURE** brake and a **SMOOTH** brake. No doubling up in a sudden stop that sets your head swimming. No jerking or chattering while the car shakes like it had a chill.

You won't fear the steepest hills with Advance Cork Insert on the job. It makes the brake *do its full duty*. It eases the car down the stiffest grade. Relieves you of all worry.

Sold in this
red and
black
box

**\$3.00 PER
SET of 3**

ADVANCE
CORK INSERT
TRANSMISSION LININGS FOR FORDS

*"One Set Will Outwear
3 of Any Other Kind"*

*"Makes A
Great Car
Greater"*

\$3

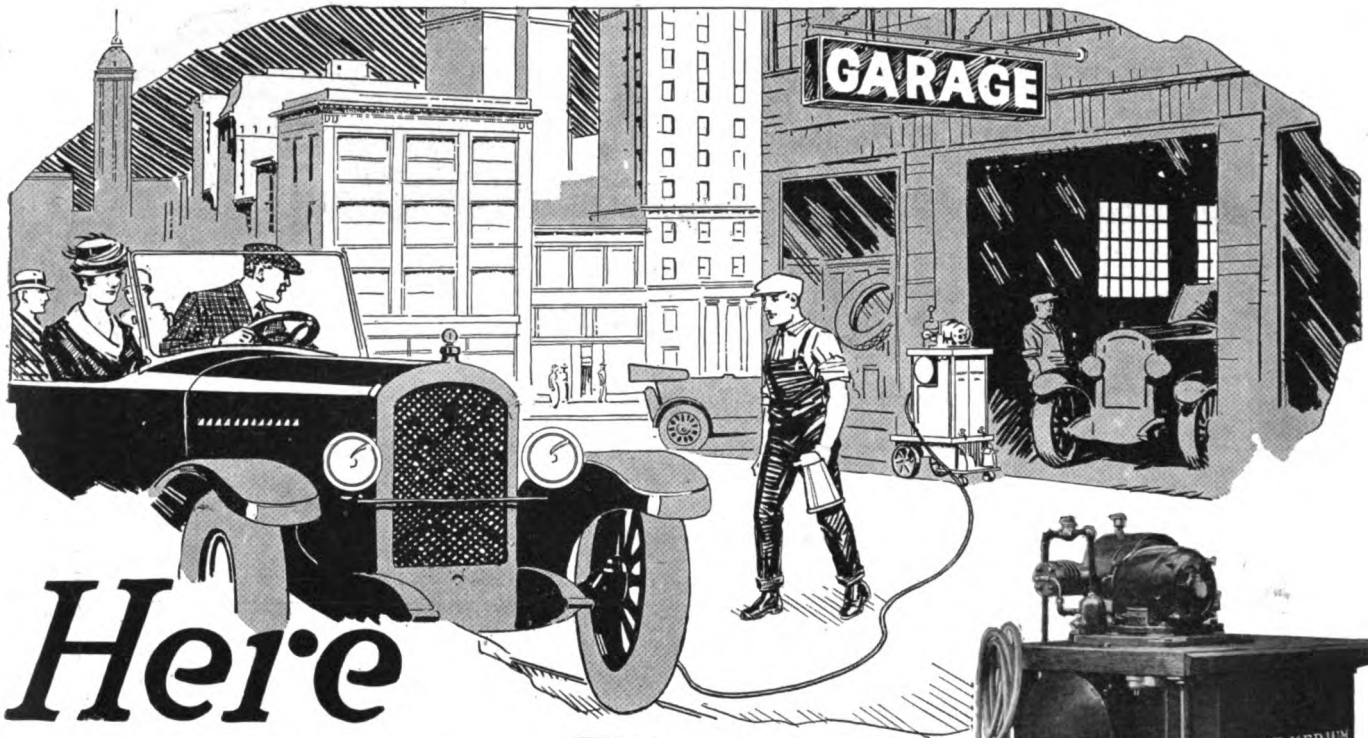
per set
of three.

Rockies West, \$3.25
Canadian, \$4.50

Ask for Advance Cork Insert next time you have your brake and speed bands relined and see that you get it. It outwears several sets of ordinary linings, and is the cheapest in the long run.

Every garage and repairman has Cork Insert or can easily get it; every wholesale house carries it. You can always tell Advance Cork Insert by its name on the distinctive red and black box.

**Advance Automobile Accessories
Corporation**
Dept. D-7, 56 E. Randolph Street, Chicago

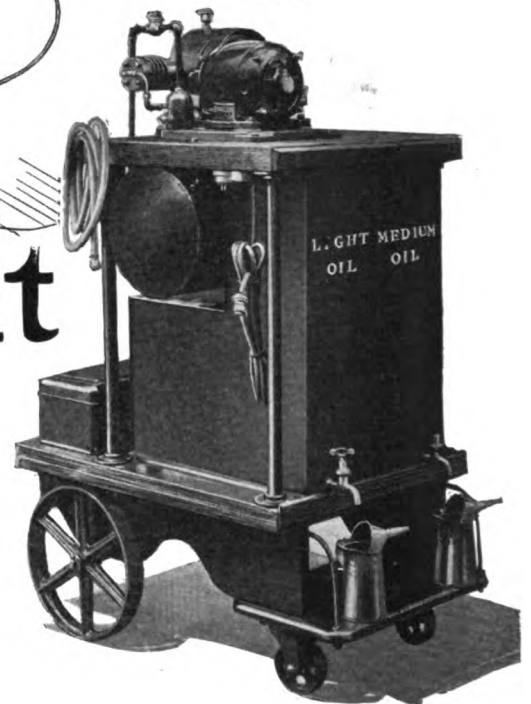


Here is your Profit

WHILE the tires are being inflated with the air that you furnish gratis, the oil service combined with this model of the General Air Compressors *makes a sale.*

Along these lines don't take our word for it, ask the motorist; he'll indorse the Utility model.

The motorist is better pleased to make a purchase of something he needs, to pay for the free air service and to give you a warranted profit.



TWO-CYLINDER GENERAL AIR COMPRESSORS

THE Utility Model gives a free air service and produces sufficient sales, not otherwise made—to show you a profit of over \$400 in a year, turning a heretofore liability into an asset. Ask for further particulars.

are constructed along the best mechanical principles producing clean, cool air at the lowest possible cost. Truly a line worth having.

DISTRIBUTORS! Some territory is still open in which you can sell many air compressors. Might as well sell the best to your customers, make an appreciable profit, and control your territory. Write for sales proposition.

DEALERS! This line is complete. Models for all purposes, all operated economically. Every piece of material entering in the manufacture is the best. The machining is perfect and the cost well balanced.

Send for Copy of "Low Cost of Cool Air" and Prices

General Utility Company

Manufacturers

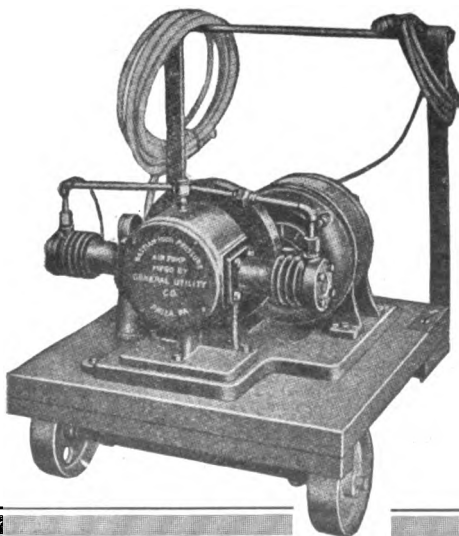
1338 Ogden Street

Philadelphia, U. S. A.

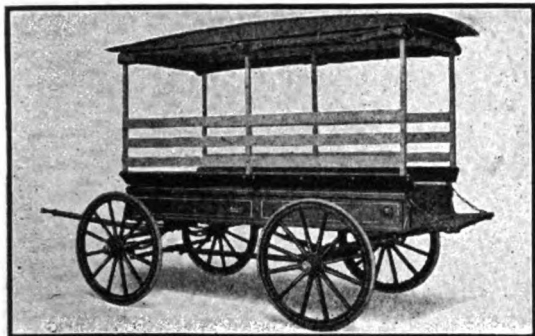
Utilities Sales Corporation

Sole Factory Distributors

Suite 811, New Stock Exchange Bldg. Philadelphia, U. S. A.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



Lets talk over this Trailer Proposition



The trailer is a demonstrated success. Every user realizes the economies his trailer has effected in his hauling costs. Many can tell in dollars and cents how much the trailer has saved them.

There are unlimited possibilities and uses for trailers. Retail merchants, wholesalers, manufacturers, express and cartage companies, construction companies, and others are rapidly adopting them.

The far-sighted dealer realizes the opportunities of the trailer.

No matter what your views may be, you owe it to yourself to investigate the trailer field.

MIAMI TRAILERS are made in many styles, embracing every purpose. They sell fast because they cost little, and soon pay for themselves.

Write today for full particulars.

MIAMI TRAILER COMPANY - - TROY (Miami County), OHIO

TIP-TOP OF AKRON TIRE-PAIR OUTFIT

The Best Equipment

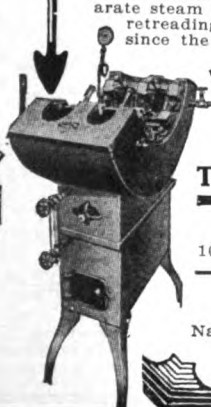
It pays to buy the best equipment if starting in the tire repair business or adding to present equipment. Tip-Top Tire-Re-Pair Equipment is regarded by tire manufacturers, tire repair schools and repair shops as representing the highest standard of quality in tire repairing equipment that it is possible to produce.

TIRE RETREADING

The high price of tires has created a big interest in tire retreading. Motorists who have worn down their tires until no longer usable want new treads put on.

Every tire repair shop should have one of these recently developed Type E Cavity Retreading Outfits, which operates on the same principle as the regular cavity vulcanizer used for repairing casing punctures and blowouts.

Cost of outfit with self-contained steam boiler is much less than that of a vulcanizing kettle and separate steam boiler. (The use of large and expensive retreading kettle outfits is no longer necessary since the development of this type of retreading equipment—and the elaborate, difficult and time-consuming system of wrapping tire is not required with the cavity method.) Outfit is very compact and takes up little room in the shop.



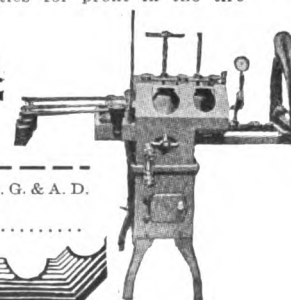
Motorists who have never bothered with tire repairing are now having casing and inner tube punctures and blowouts repaired by the vulcanizing process.

TIRE REPAIRING

Now is the timely time to start in the tire repair business.

We make a complete line of Tire Repairing Equipment—cavity vulcanizers of both the self-contained boiler and separate boiler types—Tube Plates—Steam Boilers—Bead Molds—Tire Repair Tools. No matter what you have need of we are in position to supply it to best advantage.

Write us today for literature describing our full line of tire repair equipment and data regarding vulcanizing and the possibilities for profit in the tire repair business.



THE AKRON RUBBER MOLD & MACHINE CO.

947 Sweitzer Ave., Akron, Ohio.

Pacific Coast Distributors: Geo. W. Eno Rubber Co.
1059-63 Post St., San Francisco. 1026 So. Los Angeles St., Los Angeles.

RETURN THIS COUPON FOR FREE BOOKLET

Am. G. & A. D.

Name Address

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



"NORMA" PRECISION BALL BEARINGS

(PATENTED)

Today—whether in men or in machines—the measure of value is the capacity for service. Not so much "what is the price" but "what will it do," is the decisive question. To be saleable today, a thing must above all be serviceable. And serviceability commands a ready market and a good price.

"NORMA" Precision Bearings are the standard bearings in high-grade ignition apparatus and lighting generators because the test of time has proved their preeminent service capacity. Their maximum-service qualities contribute mightily to the service qualities of those better cars, trucks and tractors that carry "NORMA" equipped accessories.

Be Sure—See That Your
Electrical Apparatus
is "NORMA" Equipped.

THE NORMA COMPANY OF AMERICA

1799 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings.



AMERICAN GARAGE & AUTO DEALER

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|---|----|
| Get Repair Work NOW..... | 20 |
| Trucks as Railroad Feeders | 20 |
| Push Highway Transport | 20 |
| Be Active in Your Trade Organization..... | 20 |

GENERAL

| | |
|---|-------|
| Wake up! Light up..... | 9-13 |
| Argument Proof Repair Order Form Devised by Columbus Tradesmen | 10-11 |
| Highway Transport Committee Reorganized. Scope Broadened | 11 |
| Maryland Farmers Run Successful Co-operative Motor Express Line | 12-13 |
| New York City Dealers Re-elect Old Officers..... | 13 |
| Oklahoma Men Erect Building in Order to Conduct a Show | 14 |
| The Small Town Post-War Market..... | 14 |
| Automotive Equipment Exhibition Planned for Chi- cago Next Fall | 15 |
| Government Will Use Movies to Aid Highway De- velopment | 15 |
| Vesper Finds South Wants Roads; Dealers Open Employment Bureau | 17 |
| Half Billion to be Spent for Road Work This Year.. | 17 |
| Sales Idea Contest Winners | 18-19 |
| Iowa Man New Head of Federal Highway Work.... | 19 |
| ACCESSIONS, by M. E. FABER | 22 |
| Red Star Timer Carton Wins Much Favor..... | 22 |
| Standard Motor-Pep Has Double Guarantee..... | 22 |
| Resume Advertising and Start Road Work, Says Car Maker | 24 |
| "Hitch On" to Big Advertising and Cash in on Mak- ers' Outlay | 28 |
| May Use Trucks for Short Hauls, Says U. S. Railroad Official | 28 |
| Installs Profit Winning Display; Total Expense Is Thirty Cents | 30 |
| Trailer Men Finish Organization; H. W. Perry Is Gen- eral Manager | 32 |
| Electric Sign Is Almost Necessity to Business..... | 34 |
| Pulcher Heads Committee to Run Motor Truck Show New Wholesale Policy Adopted by Times Square Supply House | 44 |
| Comrie and Cleary, New Firm in Advertising Field | 44 |
| Cylinder Grinding and Aluminite Pistons..... | 48 |

DEPARTMENTS

| | |
|---|-------|
| Readers' Questions Answered | 26 |
| In the Tire World | 28 |
| In the Truck and Trailer Field | 32 |
| How to Make the Shop Pay | 34 |
| Tractors and Farm Lighting | 36 |
| Practical Hints for Shops | 36 |
| Mechanical and Engineering Problems | 38 |
| Welding, Cutting and Brazing | 40-42 |
| Accessories and Garage Equipment..... | 44 |
| Buyers' Reference | 60 |
| Index to Advertisers | 61 |

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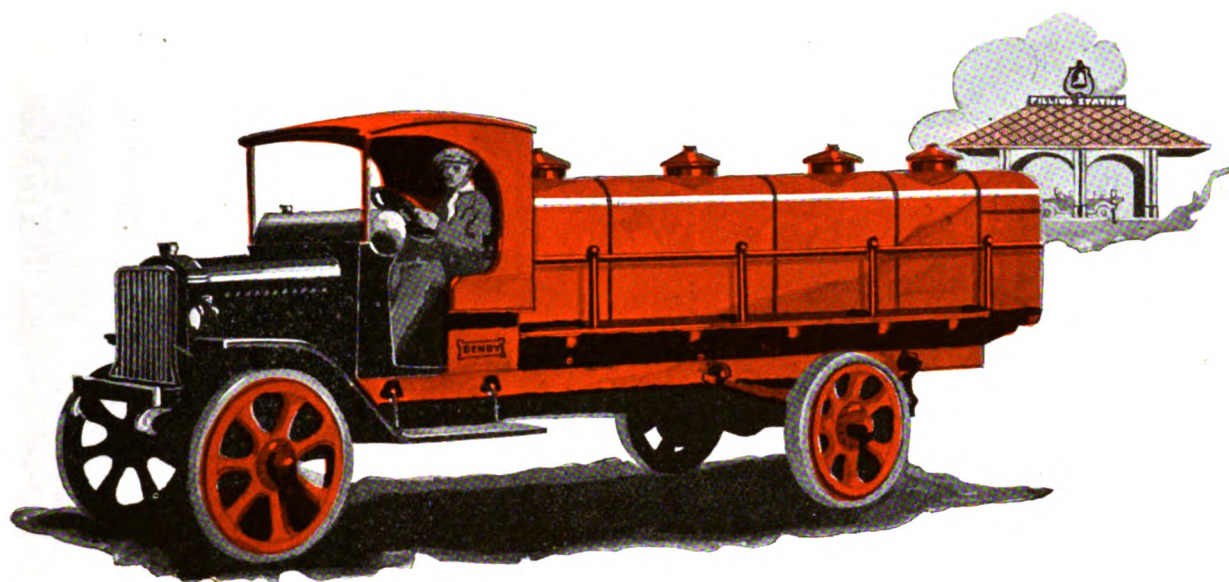
J. R. HASTIE, *President and Treasurer*
H. D. FARGO, *Vice President* E. C. HOLE, *Vice President*
E. T. CLISSOLD, *Vice President* S. R. EDWARDS, *Secretary*

R. B. JOHNSTON, *Editor*.

G. M. ALLEN, *Mgr. Copy Department*.
S. J. BORCHERS, *Asst. Advertising Manager*.

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Subscription per Annum (Postage Paid) \$1.00. Advertising
Rates on Request.



Dependability

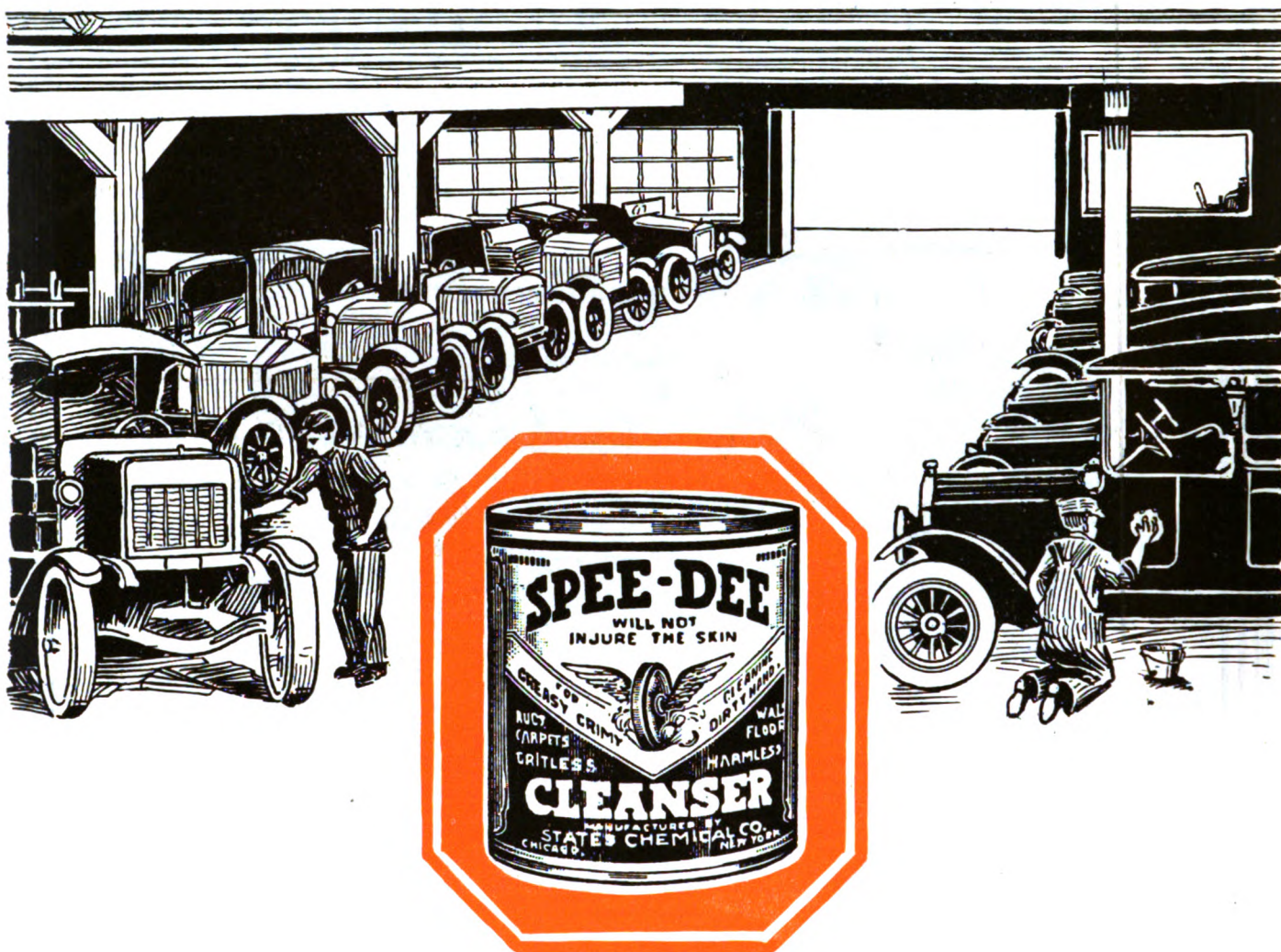
All other advantages are wasted, if a truck lacks dependability.

For the savings from speed, low fuel consumption or any other quality can be quickly dissipated by lost time and delayed or missed trips.

Denby trucks have proved themselves unusually dependable. And backing this quality is an economy and long life that is largely responsible for the satisfactory service Denbys are giving owners everywhere.

*The Denby Line is Complete
Ranging from 1 to 6 Tons*

Denby Motor Truck Company, Detroit



SPEE-DEE

**Makes quick work of the
dirty cars and motor trucks**

Nothing equals SPEE-DEE for speed and thoroughness in cleaning cars. Readily removes dust, road oil, tar, grease and dirt of all kinds. Gritless and harmless. Equally effective on bodies, wheels, fenders, trucks, machinery, tops, seat covers, and celluloid curtains. It is also useful for cleaning greasy, grimy hands, which it does with or without water.

You will find SPEE-DEE a valuable helper in your garage. The rapidity with which it cleans cars will greatly increase your profits on this work.

SPEE-DEE IS A READY SELLER

Your customers who clean and "tinker" with their own cars will buy a can of Spee-Dee, and being pleased with it, will buy again.

Write today for particulars and trade prices

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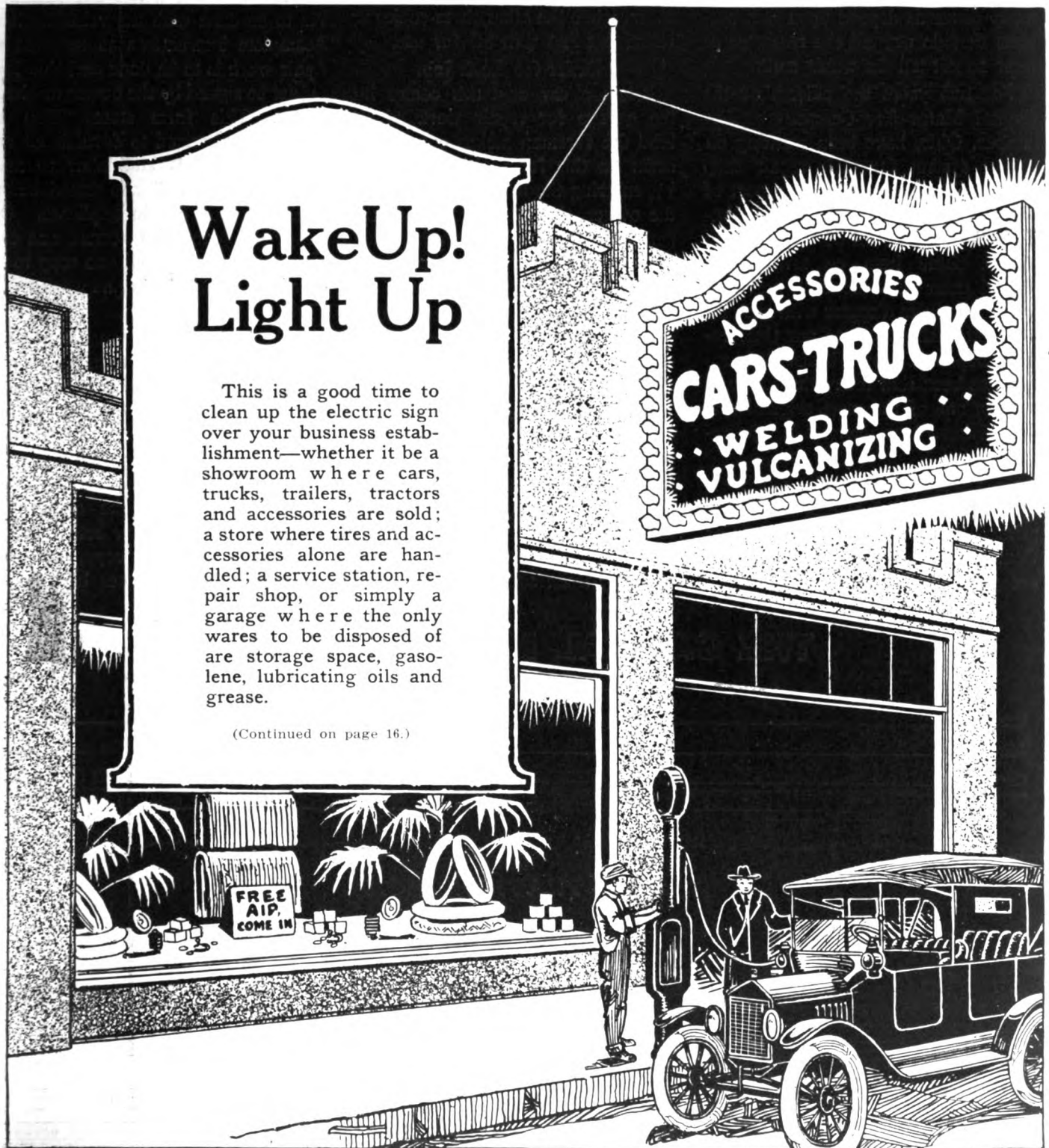
AMERICAN GARAGE & AUTO DEALER

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

Vol. X. No. 4

CHICAGO

April, 1919



(Continued on page 16.)

Argument Proof Repair Order Form Devised by Columbus Tradesmen

BY WALTER ENGARD.

The business man wants facts. He deals in facts. When he operates in the realm of surmise and fiction, the result is apt to be disastrous. Yet many concerns depend upon cost systems that do not tell the truth, or at least do not tell the whole truth.

For two years the officers of the Capital Motor Car Company at Columbus, Ohio, have been working on a cost system for their repair shop that would give an accurate report of the cost of all jobs; that would eliminate the possibilities of forgetting to charge some item or article that should enter into the cost, and that would eliminate disputes with customers, and enable them to put their repair shop on a paying basis. The result has been that today they are employing one of the most original systems I have seen devised for the repair shop.

This system is a special repair order form, 11x8½ inches, ruled and printed for the Capital Motor Car Company. This form is used on an autographic recording machine which

carriers four rolls of this form. Three of the rolls are used for the original and the duplicate copies while the fourth roll is used for a permanent record and remains inside of the machine, while the other three copies are rolled out and torn off for use.

Order for Each Job.

When a car or truck comes into the garage for repair work of any kind the foreman makes out a repair order on this form (Illustration No. 1), entering the name and address of the owner, the date, the phone number, license number of the vehicle, also the car number and whether charge or cash job.

Each job is numbered and when a form is taken off of the machine the number of the next job is entered on the form so that there shall be no skip in number. Each form is also numbered in rotation. This is to eliminate the loss of any one of these forms. Every form must finally reach the office where the charge is transferred to the ledger and these forms are then filed according to number and they must come in order. Even

if a form is ruined for some reason or other it must be marked void and sent into the office the same as the others.

The foreman writes out just what is to be done with the vehicle, giving complete instructions as to what repair work is to be done and this form must be signed by the owner or chauffeur. This form states "You are hereby authorized to furnish all necessary materials and labor to make repairs as above." As stated before, this is made out in triplicate. One copy going to the foreman, one copy to the stock clerk and one copy to the workman when he begins work on the job.

The back of the form (Illustration No. 2) is ruled so to accommodate the entry of all material and labor used in the repair of the vehicle. When a workman needs some repair part he must take his copy and go to the stock clerk for the material. The stock clerk enters the article and quantity on the form, both his copy and the workman's copy, and each evening this form goes back to the

THE CAPITAL MOTOR CAR CO. REPAIR ORDER

| | |
|---------------|---|
| Name _____ | Date _____ 191__ |
| Address _____ | Phone _____ License No. _____ Miles _____ |
| Charge _____ | Job No. <u>375</u> Car No. _____ Post Ch. _____ |
| INSTRUCTIONS | |
| PRICE | |
| SALE AMOUNT | |

ILLUSTRATION NO. 1

| | | | |
|---|------------------------------------|---|--|
| YOU ARE HEREBY AUTHORIZED TO FURNISH ALL NECESSARY MATERIALS AND LABOR TO MAKE REPAIRS AS ABOVE | | | |
| Order Received by _____ (Initials) | Signed _____ | OWNER | |
| Date Completed _____ 191__ | Total Labor only (Time Hrs.) _____ | Foreman _____ | |
| Workman No. _____ | Material _____ | Promised _____ | |
| TOTAL AMOUNT | | 17851 System - The Standard Register Co., Dayton, Oh. | |

MATERIAL AND LABOR CHARGES

| MATERIAL | | | | | LABOR | | | | |
|----------|----------|----------|---------|-------------|-------|----------|-------|-------------|--|
| DATE | QUANTITY | PART NO. | ARTICLE | SALE AMOUNT | DATE | EMP. NO. | HOURS | SALE AMOUNT | |
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ILLUSTRATION NO 2

| DATE | QUANTITY | ARTICLE | SALE AMOUNT |
|------|----------|---------|-------------|
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foreman who in turn enters all material used so far on to his copy.

Clock Registers Time.

A time clock system is used and when a workman begins on a job he goes to the clock, takes his time card and enters on it the job number and inserts it into the clock to register the time he starts the job. Whenever he leaves that job he must again register the time stopped on his time card.

The time cards go to the foreman each evening and he enters the labor that has been performed on each job

on the repair order form as provided under the heading "Labor," entering the date, the employee's number and the hours put in.

At the bottom of this form on the back a space is also provided for recording all outside work that was necessary in repairing the vehicle. Here the foreman enters the date, the kind of work and by whom done and the cost.

When the job has been completed the foreman totals the material and labor charge and carries both amounts

over to the bottom of the front side of the form and enters it there as provided, also entering the date completed and the numbers of the workman or workmen, as the case may be. All three forms then go to the office where they are checked and charged to the correct account.

Since installing this system of handling the repair work the Capital Motor Car Company is able to compute the cost of every job and has put its repair shop upon a more solid basis.

Highway Transport Committee Reorganized, Scope Broadened

Grosvenor B. Clarkson, Director of the U. S. Council of National Defense, announces a reorganization of the Council's Highway Transport Committee. The work of the Committee has been broadened to include direct representation from the office of Public Roads and Rural Engineering of the Department of Agriculture; the Bureau of Markets of the same department; the Post Office Department, and the Department of Commerce.

With this reorganization close cooperation with the executive departments most vitally interested in matters of highways transportation will be brought about in such a way that the committee will be a clearing house of action for all federal interests concerned.

The committee as reorganized consists of the following: Chairman, John S. Cra-

vens, of the Council of National Defense; James I. Blakeslee, Fourth Assistant Postmaster General; J. M. Goodell, consulting engineer, office of Public Roads and Rural Engineering; James H. Collins, investigator in market survey, Bureau of Markets; R. S. McElwee, second assistant chief, Bureau Foreign and Domestic Commerce; Charles W. Reid, executive secretary, and Grosvenor B. Clarkson, director of the Council, ex-officio.

An Advisory Board.

The committee will be assisted by the Highways Transport Committee Advisory Board, consisting of: William Phelps Eno, of Washington, D. C.; Prof. Arthur H. Blanchard, of New York; C. A. Musselman, of Philadelphia; Raymond Beck, of Akron, Ohio, and John T. Stockton, of Chicago.

The Council in addressing itself particularly to the problems growing out of the entrance of the motor truck into the commercial transportation field, will seek to determine just how the motor truck can best be fitted into the nation's existing transportation agencies.

It is the policy of the Council through its committee to cooperate with all transportation agencies with the view of determining for the people how their transportation needs can be served most efficiently, speedily and economically, and to aid in the promotion of motor express lines through rural communities which now do not have adequate transportation.

Study Short Haul Problem.

The Council will, Director Clarkson stated, cooperate with the United States Railroad Administration in the study of the short haul problem, and will also give specialized attention to the relation of the Rural Motor express to interurban electric lines and waterways traffic, in the interest of all elements concerned.

Maryland Farmers Run Successful Co-operative Motor Express Line

"What could we do when railroad service was unsatisfactory, distance to market was excessive for horse travel, and local charges for transportation by motor truck were unreasonably high, but in self-defense organize a cooperative association and handle our own hauling," replied the secretary of the Harford County, Maryland, rural motor truck route to the query of why the association was formed.

"We incorporated our association and capitalized it for \$5,000, selling 200 shares of stock which had a par value of \$25 a share," continued this official. "Each member is obliged to own at least one share of stock, but is limited in his stock purchase to 20 shares. We purchased a four-ton truck which operated between Bel Air and Churchville, Md., and Baltimore, for hauling milk, cream, and other farm produce to the city, and feedstuffs, seeds, salt, fertilizer, machinery, and supplies for the rural merchants on the back trip.

automobile tires, vegetables, and automobile, automobile truck, buggy and wagon wheels is 15 cents a hundred-weight, while second-class articles, such as axes are hauled for 12 cents a hundred pounds.

"Calves are transported to market for 50 cents apiece, while live cattle and hogs are handled at 50 cents a hundred-weight. It costs 25 cents a coop to ship chickens, while cream and milk are hauled at 2½ cents a gallon, the empty cans being returned. Wagons (knocked down) are hauled according to size: one-horse wagons, \$2; two-horse, \$3; three-horse, \$4; and four-horse, \$5."

How Losses Are Paid For.

The association pays its members for all goods lost or destroyed. Where the shipper desires insurance against loss the charge for hauling cream is 4 cents a gallon, while, if the farmer is willing to assume the risk, the same charge is made for hauling cream as for milk. In case

ford association operates one 4-ton and one 5-ton truck, which make daily trips to Baltimore, the distance traveled being about 60 miles.

Both Buys and Sells for Members.

This Maryland cooperative association is of valuable assistance to its members in both the purchase and sale of produce and supplies. Members notify the secretary of their needs, and as soon as a sufficient number of orders is on hand he buys at wholesale in large amounts in Baltimore, thereby markedly reducing the cost of the articles to the farmers, as well as minimizing trouble in purchasing and hauling goods for these consumers.

In case the individual farmer wishes to make his own purchase he does so, and has the supplies delivered at the receiving station, so that they may be hauled by truck to his farm. The motor service is of incalculable value to the members during periods of rush work when machines



Carrying Milk by Wagon to Truck Route Loading Platform.



Delivering Harrow at Farmer's Gate. Milk will be picked up at the same time.

"A Bel Air business man kindly furnished office room and clerical assistance for the association. As soon as the project was well under way a central receiving station was established in Baltimore for the reception and centralization of the supplies to be returned to the country. No attempt has been made by the association to earn dividends. Rates are made with a view to meeting the expenses, providing for depreciation, and accumulating a surplus to be used as working capital.

"The rate on goods classified as first-class and inclusive of apples, axle grease, baskets, butter, beans, buckets, buckwheat, barley, empty barrels, blankets, blacking, canned goods, coffee, cabbages, cantaloupes, fish, groceries, hardware, dressed hogs, harness, hay, iron, molasses, machinery under 400 pounds, notions, oils, onions, oranges, potatoes, dressed poultry, stoves,

of loss all cream shipments made at the milk rate are compensated for on a milk basis. If the shipper pays the 4-cent rate, all losses are settled at the market price of cream. Thus far damages have been paid out of operating revenues, although it is believed a safer policy would be to create a special reserve or claim fund to provide for such expenses. Another good plan is to take out sufficient insurance to cover both the trucks and goods in transit in case of loss.

The members of the association who live along the route have constructed loading platforms at their front gates. They are of the same height as the floor of the truck, thus facilitating the transfer of freight from the farm platform to the motor vehicle. At present, due to the expansion of the business, and especially to the hauling for country stores, the Har-

break and they are able to telephone to the city for repairs and have them delivered by the truck, perhaps the same afternoon that the accident occurred.

The association also aids its members in selling produce. One farmer had 1,500 bushels of wheat which he desired to market, but as the local miller did not want to buy, and because the farmer was too busy with other work to haul the wheat to the railroad, he turned the marketing over to the secretary of the association, who sold the wheat in Baltimore and delivered it there in the club trucks.

Milk and cream are hauled daily to the city and delivered at six to the metropolitan dairies, while poultry products and other farm produce are marketed with commission dealers and other wholesale firms. Because the eggs were strictly fresh, the association marketed them for



Loading Milk Along Roadside. Note height of loading platform is practically even with floor of truck, eliminating any unnecessary lifting. Similar platforms are placed at frequent intervals for convenience of farmers.



Supplies Delivered to City Receiving Station by Merchants Being Loaded for Delivery to Association Members. The receiving station makes it unnecessary for truck to spend much time in city getting a return load, and at the same time keeps operating costs low.

its members at a premium of three to five cents a dozen over the city quotations.

Obtaining Good Operators.

Competent, reliable, and honest operators who will make trips in a minimum of time, and handle their vehicles so as to realize the maximum efficiency from their operation, are essential where the rural truck route is to be successful. The Harford plan is to have both the driver and his helper qualified to operate the machine, so that the helper can replace the drivers when necessary.

The association also keeps several emergency drivers and helpers in reserve, so that in case of sickness or accident to the regular crews the operation of the truck will not cease. It provides a furnished house at Churchville for the accommodation of these employes, and also suggests the advisability of rewarding faithful operators with a cash bonus for honest and faithful services. The Harford association is completing a garage and repair shop at Churchville, which also will be used as a receiving station for country freight of the members who do not live along the regular route.

Project Pleases Farmers.

The Harford County Cooperative Association has fulfilled the purposes for which it was organized. It provides satisfactory transportation services at lower rates than the local railroad customarily charges, while the convenience of the farm to farm pick-up service is very pleasing to the farmers. For the hauling of milk and cream, which constitutes the majority of the business of the Harford association, the truck system provides superior facilities to those furnished by rail, especially in that it minimizes the damages and loss of milk cans which, in the instance of railroad transportation, usually represents a heavy outlay.

According to the Maryland law the cooperative association does not need to pay the heavy license fee to which private individuals who make a business of public hauling are subject. The motor route also releases for other more profitable farm work the horses and men formerly

engaged in hauling produce either to the railroad or cross country to the city market.

Field for Truck Routes.

According to the experience of the Harford County Cooperative Association the rural motor route supplies a solution of transportation and marketing problems for many farming sections which are located not more than 30 to 40 miles from a desirable city market and which are favored with permanent hard roads. Farmers who organize such associations are advised to study carefully their local conditions, so as to be sure that there is enough year-round hauling to justify the establishment of a truck route. They should raise sufficient funds at the outset, so that they can pay cash for a truck.

It is cheaper to operate a four or five-ton truck than it is to run one of two-ton capacity, provided there is sufficient tonnage available. As a rule, the new club will not go wrong if it begins business with a larger truck than it really needs, as the surplus space will allow for the expansion and development of the business which is sure to follow in well-selected territory.

Trucks of only standard make should be used, as under such conditions repairs will be easy to get and the overhauling of the truck will not be outside the ability of the average mechanic. In purchasing the truck, special attention should be paid to the cost of operation and records of performance, as well as to the price of the machine.

Much information in regard to the operation of this rural truck association is now available in Farmers' Bulletin 1032, which has been published recently by the United States Department of Agriculture. It can be obtained by writing to the Office of Information, U. S. Department of Agriculture, Washington, D. C.

New York City Dealers Re-Elect Old Officers

New York City dealers who are members of the Automobile Dealers Association of New York honored their old officers at their recent annual meeting by voting them into authority again. The men re-elected were: President, Charles M. Brown, Winton; vice-president, William C. Poertner, National; and, treasurer, William Parkinson, Stutz. Plans were discussed to obtain more suitable quarters for the organization, which has maintained offices at a hotel in New York's Automobile Row for several years.

The new board of directors includes the re-elected officers and H. R. Bliss, Dodge; H. J. DeBear, Chalmers and Maxwell; H. J. Gilmore, Packard; C. H. Larson, Oldsmobile; A. G. Southworth, Buick; W. D. Stewart, Overland, and Walter A. Woods, Peerless.

\$5 for an Attractive Window Display

If you will send us a picture of your window display, together with a description and a report of the results, we will gladly award \$5 to you for photographs accepted for publication.

Oklahoma Men Erect Building in Order to Conduct a Show

A hitherto untold story of the determination and the resource of the automobile dealers of Oklahoma City to hold an annual show was brought to light by President F. W. A. Vesper of the National Automobile Dealers' Association on his recent visit to the Texas district meeting of the N. A. D. A. at Houston.

The story of the Oklahoma City show, Mr. Vesper declares, is one of the best examples of what organization will do that he has encountered in months. The story was told by M. H. Randall of Oklahoma City, one of the speakers at the Texas district meeting at Houston. It was made quite casually in the course of a conversation with Mr. Vesper and evidently appealed to Randall as nothing out of the ordinary, he, in fact, being inclined to believe that automobile dealers in about every other city of the country would do the same thing under similar circumstances.

"We're just getting down to hard work in Oklahoma City in our organization," Mr. Randall declared. "We put on a show this spring and I don't believe there was a better in the country. We built a building temporarily for our use. It was impossible for us to get the kind of a structure we wanted. Theaters were out of the question. We were arranging for a combined automobile, tractor and accessory show. It looked for a while like we were up against an irremediable situation.

Space All Sold.

"Then we decided to dig down into our own pockets for a temporary structure. We had to have a building at least 200x270 feet. We laid out a definite plan of the building and of what was to be in each section. And, we sold every foot of that space. There were 104 exhibitors signed up for the exhibit, their equipment and apparatus ready to move when we said the word, their money in the bank payable to our demand, flags, bunting, pennants and special exposition auxiliaries ordered when we began striking snags.

"Being a co-operative enterprise and one which we figured was calculated to attract thousands of visitors to Oklahoma City, we went to the Chamber of Commerce and asked for a little, well, call it moral support. Our Chamber of Commerce is mostly a bunch of real estate dealers, and one fellow said:

"'Why, you can't do that—it will cost too much money.'

"'Yes, sir,' we told him, it's going to cost a bunch of money, but it's the biggest proposition that's been put up to Oklahoma

City in years.' But that fellow was a 1913 model and we didn't have a chance to put a self-starter on him.

"Another said, 'The city won't let you build a building like that. It's against the fire rules.' Another said, 'Why, you can't find a lot to build it on? The main man in the bunch wouldn't listen at all, so we got up and left. What we had feared we would have to do, put it on by ourselves, when we went to the meeting, we were determined we'd do, after the meeting.

"Well, we put the show on. We found

a lot. We got extra fire protection. We rushed carpenters and builders onto the ground. We moved our equipment and displays into the place and opened our gates on time. Instead of 'costing too much money,' as the 1913 model had suggested, we made \$2,000 profit over and above all the money we had expended. And, we spent more money than we thought we would."

Mr. Randall is now looking about for a man who can carry on the organization work in Oklahoma for the N. A. D. A.

The Small Town Post-War Market

There are 68,707 towns in the United States with less than 10,000 population, and two-thirds of the entire population of the United States lives on farms and in these towns up to 10,000. Considered together with these figures should be the fact that the total value of all farm products for 1918 reached the stupendous sum of twenty-one billion dollars.

Statistics make dull reading and leave little impression. It takes more creative imagination than anyone possesses to conceive of millions of individuals, millions of homes, thousands of towns. Therefore the concept or symbol known as "the average," which in reality does not exist at all, is so convenient and acceptable.

It is impossible to visualize these 68,707 villages throughout the length and breadth of the country, fringing the coast line, dotting the plains, nestling in the mountains. One can picture two or three or a half dozen small towns with which one is personally acquainted, but in so doing fail to grasp the potentialities of over 68,000 of such towns.

Manifestly the total amount of money spent in the towns of 10,000 or less is enormous. The farm family naturally purchases a goodly amount of its needs in the nearby town, just as the residents of the town buy within their own boundaries. This means that two-thirds of the population of the country—over 66 millions of people—trade in centers which individually seem so insignificant, that the manufacturer seeking national distribution for his product is prone to overlook them.

For obvious reasons the centers of concentrated population are the most conveniently covered by salesmen and by advertising, which fact is no argument for neglecting this market where 66 million buy.

With the advent of peace the potentialities of the small town market are greater than ever before. Because of their quieter, less complicated life, the small towns have probably concentrated more than the cities and larger towns on war-saving and war-giving. They have invested lavishly in liberty bonds and thrift stamps. They have saved money and conserved food, clothing and other commodities. They have built no new homes, nor rebuilt old homes.

But other equally important changes have taken place in the small towns during the period of the war. Brought into closer contact with the great outside world by the war, their people have acquired new ideas, new interests, new demands.

Today with greater accumulated savings than ever before, with wider viewpoints, and with the strain and stress of the war removed, the small towns of the country represent a highly prolific field of trade which thus far the national advertiser has scarcely scraped.

—Judicious Advertising.

Automotive Equipment Exhibition Planned for Chicago Next Fall

Directors of the Automotive Equipment Association, at their meeting April 8, decided to hold a show in Chicago during the latter part of October or the first part of November. Representatives to the Chamber of Commerce of the United States and to the convention of the National Foreign Trade Council were selected. Some slight modifications were made in the by-laws and a number of resolutions rescinded. It was also decided to abandon the name "ways and means committee," and to adopt the more dignified name of "board of governors."

The exhibition in the fall will be conducted under the direction of the just appointed show committee, made up as follows: Chairman, L. P. Halladay, Illinois; R. R. Englehart, Iowa; G. L. Brunner, New York; W. K. Norris, Missouri; and F. B. Caswell, Ohio.

It is the intention to hold the show under substantially the same conditions contemplated for the proposed show last fall, given up owing to the war. The feeling has been expressed that the exhibition should be a closed show to manufacturers, but not to jobbers.

Show Status to Be Discussed.

In the discussion over this question it developed that some of the directors who had favored the open show last year have changed their position on this subject. This matter will be taken up for further consideration at the Hot Springs convention, June 2 to 6.

The following representatives to the Chamber of Commerce of the United States were elected: National councillor and delegate, E. C. Graham, Washington; substitute national councillor, Louis Safford, Missouri; delegate, F. B. Caswell, Ohio; and substitute delegate, W. L. Niekamp, Missouri.

Representatives to attend the convention of the National Foreign Trade

Council, which is to be held at the Congress Hotel, Chicago, April 24 to 26, were elected as follows: F. B. Caswell, Ohio; N. H. Oliver, Illinois; and W. T. Walker, Wisconsin.

It was decided that section 2, article 1, of the by-laws of the organization be modified as follows:

By-Law Change.

"Section 2. Any person, firm or corporation engaged in the jobbing of automotive equipment in the United States or Canada, who has a regular established place of business, buys in bulk or quantity for resale to established retail dealers, and whose major portion of business is done at wholesale, and who maintains a sufficient general stock to meet the requirements of his trade and keeps local and road salesmen, or any person, firm or corporation engaged in the manufacturing of automotive equipment, who produces one or more articles in the line, and in the ordinary, practical and commercial sense of these terms is generally recognized as a jobber or manufacturer in this line of goods, may upon written application, become

a member on receiving a vote of three-fourths of the members present at any regular or special meeting and any one so elected shall be entitled to full membership, and to all rights and privileges thereunder."

An advisory committee of six has been created and elected by ballot on popular vote. This board is composed of an equal number of jobbers and manufacturers, and is to meet at least once a month at the call of the chairman to confer with Commissioner Wm. M. Webster on important matters that may arise from time to time. The makeup of the committee is as follows: Chairman, R. R. Englehart, Iowa; N. H. Oliver, Illinois; Fred Campbell, Missouri; R. A. Stranahan, Ohio; J. S. Proctor, Minnesota; and L. P. Halladay, Illinois.

Those in attendance at the meeting were: R. R. Englehart, R. A. Stranahan, J. S. Proctor, S. T. McCollum, F. T. Chase, Louis Schwab, G. L. Brunner, J. E. Millen, H. M. Dine, N. H. Oliver, J. M. Bloch, E. A. Pegau, Fred Campbell, S. F. Beech and Commissioner Webster.

Simpests

The man who invented Solitaire was not a poker sharp.

The average man doesn't mind 100 in the shade during the winter and he glories in cold weather during the summer.

It's surprising the number of "kids" there are wearing long pants and shaving three times a week.

If the average garage employe thought as much of the boss' business as he does of planning his leisure hours the boss would be happy.

Many a salesman loses a good prospect because of a "gossipy" tongue.

There's an old saying, "If your competitor talks about you, put him on the payroll."

The garage employe who smokes while on duty is a dangerous man to have around.

Zero hour is always on the boss' time, with some employes.

There's all kinds of liars—for instance, the chauffeur who could have married the boss' daughter and didn't.

With proper management trade follows the house—not the employe. Let a man do you a favor and he's your friend for life.

All cars are good cars, but some are better than others.

Newburgh, N. Y.

Wake Up! Light Up

(Continued from page 9.)

If you have not, up to this time, purchased an electric sign you ought to consider this subject very carefully. Owners of service stations, repair shops and stores where accessories are sold are practically certain of increasing the number of their customers by installing electric signs. This is especially true of establishments that are kept open after dark.

Considered from the advertising standpoint alone, an electric sign is a good investment. The cost of these profit producers is not very great, and there are a good many types on the market from which the enterprising automotive merchant can make a selection. In the majority of cases the expense of maintaining them is not very great, as comparatively little electric current is required for them.

Automotive merchants who sell farm electric plants can do some very effective and inexpensive missionary work for these outfits by using them in their establishments.

In our March issue Mr. Faber told about an enterprising firm in Wau-pun, Wisconsin, that has increased its sales of farm electric plants because it follows the advice it gives to others by using a farm electric outfit to illuminate its entire establishment and also a big sign out in front. Mr. Faber told how this use of an electric plant had made that particular garage known as "the brightest spot in town."

Lights Attract Customers.

Customers who wish to buy supplies or accessories, or to have minor repairs and adjustments made are more likely to go into a brightly lighted place than one that has only a few electric lights or where the illumination is supplied by gas or kerosene lamps.

There is one great advantage to the automotive merchant in having his place brightly lighted at night in the event that there is any repairing or adjusting to be done. The liability of making mistakes is very much lessened and at the same time it is possible to finish the work very much

quicker when it is done where there is plenty of illumination for the mechanic.

When automotive merchants handle accessories, and all of them should, they will sell more of them if their places are well lighted at night. An attractive window display which is not lighted at night is prevented from doing its full duty. It simply means that the merchant is voluntarily limiting the advertising and profit producing value of the window display because he has not made arrangements to light it up so possible customers could see it after dark.

Automotive merchants who have studied this subject will remember that the majority of the retail stores in the big cities have their windows brightly lighted at night. The owners and managers of these places must make money on the outlay for electric current, or they would not keep the lights burning in their windows. The same principle will hold good for the automotive merchant, whether he be located in a small town or a big city.

Government Will Use Movies to Aid Highway Development

Holding that sound highway development is a question of basic importance to the people of the United States, officials of the Visual Instruction section of the Department of Interior are perfecting plans for an international distribution of slides and motion pictures depicting road construction and the benefits to be derived therefrom.

The work is under the charge of F. W. Reynolds, associate director of the educational extension division, who is assembling as his aides some of the best known authorities in the United States in all branches of visual instruction from the first preparation of the film to its introduction to the school, church or club in the smallest community in the country.

"The Visual Instruction section will seek to present topics of national interest through the medium of an elaborate 'hooking' system," says Mr. Reynolds. "Arrangements have already been perfected for distribution of these films and slides in twenty-five States and we are rapidly

adding to the number. A set of 40,000 questionnaires sent out recently to university, school and community centers and others developed a surprising interest and everywhere there is a keen demand for educational subjects presented by the government.

"In the War Department archives there are now some 1,000,000 feet of film negative presenting every phase of America's participation in the war, little of which has yet been released. We are now making a topical digest of this material with the idea of making war subjects our leader in various topical reviews.

"Thus in the case of highway development we can first show road making in France under fire, the difficulties of transportation, etc., and then branch from that into road construction as carried on in the United States with 'cut-ins' showing the results of road improvement interpreted by the eye, the surest educational sense we have.

"Unfortunately our funds do not permit us to enter into an extensive film making campaign, hence we are calling upon the

National Automobile Chamber of Commerce and other associations which may have films on this subject, to loan them to us. No advertising matter of any kind could be used by the government, beyond a courteous acknowledgment of the source of the picture, but by editing scenes from a number of reels, we can build up a series of say ten one-reel features, which we will then link up with war pictures and send out broadcast.

"Later as the value of this work becomes apparent we expect to have feature films prepared and offered for use after government inspection. These will always be available to any community desiring them, free of charge.

"In the meantime we are making arrangements to make use of slides which government agencies have on hand and will extend this as rapidly as we can procure new films.

"It is also our plan to interchange highway reels, for example, with Great Britain, France and other countries in order that our people may see what they are doing and to give them the benefit of our work."

Thrift, safety, health and other basic subjects will be similarly treated as the demand arises and it is believed that this new government plan will stimulate public welfare to a remarkable extent.

Vesper Finds South Wants Roads; Dealers Open Employment Bureau

Sentiment in the South is highly favorable toward the enactment of the Townsend highways bill, a measure which was introduced in the last Congress providing for the creation of a National Highways Commission with powers similar to that exercised over the railways by the Interstate Commerce Commission, according to F. W. A. Vesper of St. Louis, president of the National Automobile Dealers' Association.

Mr. Vesper just made a trip in behalf of good roads and N. A. D. A. membership, visiting Memphis, New Orleans, Oklahoma City, Dallas and Houston, attending the convention of the Southwest District Division of the N. A. D. A. at the latter city.

A vigorous campaign for members will be opened in Texas as the result of President Vesper's trip. H. L. Robertson of Houston was named president of the association and announced the appointment of W. A. Williamson of San Antonio as a field representative in the Lone Star State to obtain the membership of all Texas dealers in both the Texas State Association and the N. A. D. A. Vice-presidents of the Texas Association are Mr. Williamson, Percy Garrett of Fort Worth and W. T. Herrick of Waco.

Louisiana Men Join.

While Mr. Vesper was in New Orleans the directors of the New Orleans Automobile Association voted the entire membership of the local into the N. A. D. A. Arrangements are under way at New Orleans to put on an intensive campaign for N. A. D. A. memberships in southern Louisiana and southern Mississippi.

General Manager Harry G. Moock announces the appointment of N. L. Tooker of New York City as traveling field secretary in the Eastern Division, with headquarters in New York. He is a former automobile dealer and advertising specialist. With Robert E. Magner of Seattle, whose appointment was announced last week, the N. A. D. A. now has three traveling field secretaries. Arrangements are being made to add seven more.

The situation in Arkansas is encouraging. The Little Rock dealers are virtually in as a body. A local association has been formed at Pine Bluff and memberships are being received from the individual members. Secretary A. W. Parks of the Arkansas Association is arranging to organize associations in Fort Smith, Texarkana, Jonesboro, Helena and the like.

Employment Service Started.

A clearing house for salesmen, sales managers and service managers, long a need of the automobile trade, and surrounded by every safeguard for efficiency and reliability, is now a possibility for the 30,000 automobile dealers of the country and the owners of service stations. Harry G. Moock, general manager of the National Automobile Dealers' Association, announces the opening of this new bureau with quarters in the Association offices, 3124-a Locust street, St. Louis, Missouri.

The bureau will be operated along the lines of filling the requirements of the employer, filling the requirements of the applicant, and filling the requirements of the applicant into the requirements of the employer.

For some time automobile dealers have realized the shortage of first class salesmen and service managers. Those who have ranked 100 per cent or thereabout did the natural thing, stepped over the heads of the men hiring them and went into business for themselves. As a consequence the dealers' end of the business has kept steadily advancing year after year while the salesman's end remained more or less at a standstill. The employer today demands a salesman or a manager of the same type as himself, insisting on personality, a high moral standard, a good commercial and technical record and with such other achievements as will be of benefit in his own particular line.

While the employers are making demands, the employees, the salesmen and managers also have demands. They demand that employers too have standards, that their spoken word be as good as their bond, that they be reasonable in their conduct toward their employees, that the chance to make money be always present and more importantly that the main chance be always kept open.

Square Deal for Both.

The National Automobile Dealers' Association's placement service will be based on lines insuring that the employer and the employee gets a square deal. Every applicant and every employer will be furnished with a written blank form upon which he will set forth his needs. To satisfy the employer the record of every employee will be analyzed. The professional job hunter will, so far as it is possible, be weeded out, the endeavor will be to save the employer time and expense, and give him a man of the temperament,

experience, personality and the like that he requires. This service will allow the employer to get in touch with men all over the United States where he previously was able to deal only with those in his immediate vicinity.

The effort for the employee will be one on behalf of both the man who is out of work and the man who has a position but who feels he could better himself by a change. This latter percentage is not large enough to cause the right kind of employers to worry. It is estimated that about 75 per cent of the firms of a business in which a man is engaged, offer him his best chance by remaining with the firm. The changes come from the other 25 per cent.

The service through this bureau is available immediately. Blank forms can be had at the office of the secretary and manager. Every application received will be filed and the desires of the applicant fitted in with the desire of the employer or vice versa. This service will be conducted without charge to dealers who are members of the National Association or to the applicant.

Half Billion to Be Spent for Road Work This Year

Expenditures for highway construction work in the United States this year are likely to amount to a half billion dollars or even more, according to a statement made by officials of the Bureau of Public Roads, United States Department of Agriculture. On reports received from State highway departments, the bureau estimates the expenditures for roads and bridges at \$385,000,000, or \$110,000,000 more than the average expenditures for 1916 and 1917. This estimate does not include, however, the additional Federal funds which will be available if the amendment to the Post Office appropriation bill, making \$50,000,000 immediately available and \$75,000,000 more on July 1, is enacted into law.

Estimated work under control of the State highway departments includes \$45,000,000 for the construction of 5,000 miles of road now under contract, \$30,000,000 for 4,000 miles of construction ready for contract, \$100,000,000 for 16,000 miles of contemplated construction, and \$60,000,000 for maintenance of 200,000 miles. Expenditures of counties, townships, and local road districts are estimated at \$100,000,000 for the construction of 15,000 miles and \$50,000,000 for maintenance of 100,000 miles.

Sales Idea Contest Winners

First Prize, \$25—

H. E. Rose, Chicago, Ill.

Second Prize, \$15—

C. H. Wooden, Lamar, Colo.

Third Prize, \$10—

Charles Olive, Willmar, Minn.

Prizes in our Sales Idea Contest, that closed March 1, have been awarded in the order given above.

First place goes to H. E. Rose, who, when he made his entry for the contest, was sales manager for the Fulton Motor Truck Co., of Farmingdale, Long Island. Now, however, Mr. Rose is vice-president and general manager of the Fulton Truck Company of Illinois, which has recently started business in Chicago. His article is given below.

Second honors were captured by C. H. Wooden of Lamar, Colorado, who also took second prize in our Advertising Contest that closed August 1 and was described in the October issue of this journal. This time Mr. Wooden won with a plan to gather in profits at Christmas time and his plan will be illustrated and described in our May number.

The third prize was won by Charles Olive of Willmar, Minn., whose sales idea was given in our January issue and is here reproduced.

Mr. R. B. Johnston,
Editor American Garage & Auto Dealer,
Chicago, Illinois.

Dear Sir:

That article by Charles Olive in the January number of your paper, telling how forty cars were sold in three months in a small town, was very interesting to me. So I am writing to tell you about another sales plan that worked out very well, only in this case it was to merchandise trucks.

It came to my attention while I was manager for the Van Brunt Automobile Company at Omaha. We had, at Logan, Iowa, two young chaps, not yet twenty-one years old, handling our line of cars who were extremely live wires. I had made efforts for some time to get them to take on the Fulton truck, which the Van Brunt concern distributed in that territory.

They fought shy of the truck proposition for a long time, giving as their reason that they did not know of any truck prospects and did not feel able to invest the money required to obtain a truck to use as a demonstrator. Finally I prevailed on them, however, to take one truck, with the understanding that if it was not sold in thirty days I would permit them to return it and apply the purchase price on their automobile account.

They agreed to this and in the course of a couple of weeks were back at the Omaha office for another Fulton chassis. They told me they had sold their demonstrator, as well as the one they were going to drive back home with them that day.

In the course of a couple of weeks more, they were back for another truck and a short time later came in to buy three more Fultons. This aroused my curiosity and I asked one of the young chaps where they had made all the sales when previously they had been so certain they could not dispose of a single truck.

He astonished me by replying that they had not sold the three trucks as yet but that they had hatched an idea.

They had gone around to the merchants in Logan, which is located just forty miles Northeast of Omaha, and found that they were suffering a great deal through local railroad freight shipments being delayed. It seems it frequently required a week to get goods from Omaha to Logan over the railroads and the two young dealers found they could obtain more than enough shipments to keep three trucks busy hauling freight from Omaha to Logan.

He then went around to a great many of his farmer friends and talked to them, looking for shipments to Omaha so the trucks would run loaded in each direction. He found the farmers had sufficient live stock for the Omaha market to keep him supplied with loads for the three trucks from Logan to Omaha.

At first I rather discouraged the idea, fearing they would neglect their automobile and trucks sales running a rural motor express line. But he promptly advised me that was not his intention, as he figured he could sell the route within three weeks, getting full list price for the trucks as well as a profit for the business.

The result was that we bet a hat on the proposition and in one day less than the three weeks agreed on as the time, I bought a \$6 hat for him.

The foresight of these young men not only sold the three trucks but proved a wonderful stimulant to the truck business in their territory. The farmers in that region, with the proved example before them, became acquainted with the advantages of marketing their hogs and other live stock by means of motor trucks.

The farmers discovered they could load ten or a dozen hogs on a truck, when the animals were ready for the market, and send them into Omaha in a few hours, getting the top prices at once. Formerly, when the farmers did not have enough hogs at a time to make up a freight car load they had been forced to take what prices the scalpers offered, which were always

\$1 and \$2 under the price that hogs were bringing at Omaha.

Very truly yours,

(Signed) H. E. ROSE,
Sales Manager, Fulton Motor Truck Company.

BY CHARLES OLIVE.

The manager of a popular garage in a Minnesota country town of six thousand population made a most remarkable success last summer selling automobiles. It was rather late in the spring when he obtained the agency for the Chevrolet car, but after only a few weeks' advertising, so many people in his community wanted one of these cars, that he could hardly get enough of them to supply the demand. The purchasers were mostly farmers, and this is the way he got in touch with them.

First, he inserted in the county papers an advertisement like this:

The Common People's Car

If you ever intend to buy an automobile, come in, as soon as you get the time, and look over the beautiful new car we handle. It is not too heavy, and not too light. It uses little gasoline, has plenty of power, and is up-to-date in every way. It is built for use, and the price is as popular as the car. Come in at once.

The Chandler Garage.

The above advertisement served to make the dealer known in the neighborhood, and brought many prospective buyers. But to better get in touch with those in the neighborhood who really figured on buying cars, the dealer used the following plan. He purchased wholesale a few boxes of good cigars, and had printed up several hundred small cards, containing the following reading:

Get a Cigar Free

On the back of this card, write the correct name and address of any neighbor who you know figures on getting a new car. Then drop the card in the card box, and get a good cigar free.

The Chandler Garage.

The box for the cards was made of wood, with a slit on the side for dropping in the cards; and the outfit, with a sign above it calling attention to the plan, was put up in a convenient place in the garage. Every car owner who came into the garage received one of the cards, and when he had filled this out, a cigar was presented to him. There were quite a few cards in the box every evening, and to each address the dealer sent the following circular letter:

Dear Friend:

If you need a car, or intend to trade off your old one, we have something to offer you that is sure to please you. We are now handling the Chevrolet car, the most popular automobile of the day for the price. It is not too heavy, and not too light. It is easy on tires, and takes little gasoline, but at the same time has lots of power. It is fully equipped with self-starter and electric lights, and is built for service and not for show. It is just the car for daily use, and the price will not give you sleepless nights. Many of your neighbors will soon be driving these cars, for the machines are going as fast as we get them home. We shall be pleased to have you come in and take a ride in one of these automobiles, so you can see for yourself what the cars are good for. But please come soon, or call us up by phone, and we will demonstrate the car at your home.

Yours cordially,

The Chandler Garage.

As soon as any sales were made, these were reported to the local papers as news. Now it may be that the quality and price of this car had much to do with the business obtained, and it may also be that the agent's selling abilities were much above the average, yet who can deny that this dealer's success in making sales has been phenomenal?

In three months he sold forty cars, and orders were still received faster than the cars could be obtained. It seems to me that no dealer could do better with any kind of a plan in a town of only six thousand population.

Richmond, Virginia—according to the Automobile Blue Book—holds, as one of the points of interest, the "House in which Aaron Burr was a guest during his trial for treason."

Iowa Man New Head of Federal Highway Work

Thomas H. MacDonald, Chief Engineer of the Iowa State Highway Commission, has been appointed by the Secretary of Agriculture as engineer in immediate charge of the work under the Federal Aid Road Act, which provides for cooperation between the states and federal government in the construction and improvement of roads.

Mr. MacDonald will assume his new duties as soon as he can close up his work in Iowa. In the meantime he will continue to keep in close touch with the Federal Aid Road work of the department, as he has done during the past two or three months. Steps already have been taken to expedite the resumption and extension of highway construction under the terms of the federal law, as amended by the Post Office Appropriation Act, and nothing will be omitted to facilitate the vigorous prosecution of the work.

The regulations have been carefully revised in the light of past experience and of suggestions offered by the State Highway Departments, the standards for plans, specifications, and estimates have been modified to meet special conditions existing in some of the states, and other changes in practices and procedure have been made, all with the definite object of speeding up the work.

Mr. MacDonald will immediately supervise and direct all the activities of the Bureau of Public Roads under the Federal Aid Road Act, including the expenditure of the additional appropriation of \$209,000,000 provided by the Post Office Appropriation Act for the extension and development of highway construction during the present and the next two fiscal years.

For the time being, in the midst of the pressure incident to the resumption and extension of road work, Mr. MacDonald will devote his energies to problems arising under the Federal Aid Road Act. It is planned that, in the near future, he will formally assume the position of director of the Bureau of Public Roads, made vacant by the death of Logan Waller Page.

Mr. MacDonald was graduated from the Iowa State College in the civil engineering course and was employed by the Chicago Great Western Railroad for a time on track work. In 1904 he became Assistant Professor of Civil Engineering at the Iowa State College and was placed in charge of road investigation work.

In 1906 he was appointed highway engineer with the first highway commission in Iowa and held this position until 1913, when he was made chief engineer of the present State Highway Commission. He is also supervisor of state roads. He is a member of the executive committee of the American Association of State Highway Officials.

EDITORIAL REMARKS

Get Repair Work NOW

Every owner of a repair shop ought to be exerting himself in every possible way to get all the repair jobs he can into his place NOW. It makes no difference whether an automotive tradesman is at the head of a big establishment with dozens of workmen or whether he conducts a small shop of his own in which he is head mechanic and has but one helper.

Because of the mild weather during the winter a great many motorists kept their cars in constant service and did not lay them up to as great an extent as formerly. Some of these owners have undoubtedly intended to have their automobiles overhauled or repaired but have postponed doing so owing to the fact that they were using their cars much of the time. But a campaign started now by the repair shop owner to get some of these vehicles in to be fixed up before warmer weather, and the resulting increase of extended tours, swamps him with work will surely prove profitable.

If the repair man will explain that better, and perhaps cheaper, work can be done when the shop force is not rushed he will be able to get in many jobs that might have to be taken to some other place if the owner delays another month or so. A lot of this work can be obtained by using advertisements in local newspapers, through personal letters or circulars, as well as by solicitation in person or over the telephone.

Trucks as Railroad Feeders

The suggestion of an official of the United States Railroad Administration, outlined on another page of this issue, that railroads may some time take up the rails on their short lines and use the road beds as motor truck highways opens up another big possible field for the use of commercial automobiles. The railroad official calls attention to the fact that, in many cases, freight carried over branch lines is delivered to the main line railroads at a loss.

He seems to think it would be quite possible to avoid these losses if motor trucks were used as feeders for the trunk line railroads. If this can be done the substitution of motor truck lines for the branch railroad lines would surely be a welcome change.

The success with which motor trucks were used during the last couple of years to relieve the freight congestion of the railroads would seem to indicate that the proposed plan must be adopted some time. The sooner it is done the better it will be for both railroad stockholders and the public.

The rapid increase in the number of rural motor truck express lines has only been possible because they have provided a service not available before. Lack of roads capable of sustaining heavy truck traffic has been the

greatest obstacle to the establishment of an ever greater number of these motor truck lines. But if it were possible to use the well graded roadbeds of branch line railroads as truck highways the number of miles of available improved roads would be vastly increased, and the truck makers would at once have many new customers.

Push Highway Transport

All members of the retail automotive trade should do everything in their power to further the rapid spread of the highway transport idea. It is to be expected that sellers of motor trucks will support the movement, as they will benefit directly and immediately from the increased number of motor trucks in service.

But passenger car agents, accessory dealers, garage operators, and owners of repair shops or service stations should also help the movement with all their energy for its development means more business for them. As more and more goods are transported over the public roads great strides are certain to be made in the construction and maintenance of the public highways. And with the betterment of the roads more passenger cars will be sold and used than ever before, benefiting all branches of the trade.

Be Active in Your Trade Organization

While the growth in membership strength of the National Automobile Dealers' Association has been very wonderful during the last year it is evident that far too many motor tradesmen fail to realize the advantages of belonging to the organization. There are so many ways in which affiliation with a trade body is valuable that no retail automotive business man can afford to remain outside the ranks of his trade associations.

Many problems are constantly arising, of a local, state and national character, that can be better solved by organizations rather than by individuals. Especially is this true of legislation, for makers of laws—whether city aldermen or United States congressmen—are more likely to listen to and heed protests of big organizations than of individuals.

In working for the construction and maintenance of improved highways, which are needed for the continued prosperity of the automotive business, trade associations are able to do more effective work than individual dealers. Shows can be better conducted by organizations because the work can be divided up among a number of committees and in many cities and towns the trade would be forced to get along without these stimulants of the business if it were not for the dealers' associations.

Join your local or state trade body and, if necessary, help to organize it.

Install a Curtis Air Compressor



The Curtis Sign

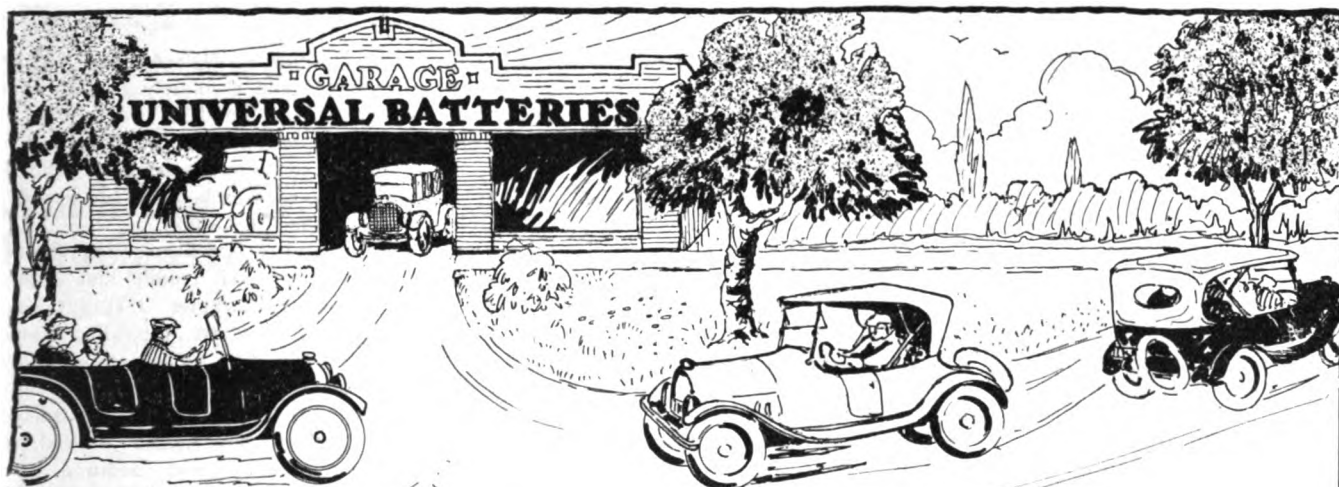
Illustrated above—is 10x14 inches—baked enamel on steel. Cannot be bought, but is furnished FREE with every CURTIS Garage Air Compressor—and cannot be had in any other way.

Display a CURTIS "FREE AIR" SIGN above your door—it inspires confidence and will help build your business. Motorists are looking for this familiar CURTIS slogan—because they know oil rots tires—and that a CURTIS Air Compressor furnishes AIR FREE FROM OIL, which means fewer blowouts, greater tire mileage and less repairs. The CURTIS is the ONLY Garage Air Compressor with the controlled splash oiling system that eliminates all danger of forcing oil into the air line.

CURTIS AIR FREE FROM OIL

Investigate the many exclusive features of CURTIS Garage Air Compressors. The line is complete—five sizes—stationary or portable. Just write your name and address on the margin of this advertisement—tear it out and send it to your jobber, or to us direct, for complete information and prices.

Curtis Pneumatic Machinery Co.
1515 Kienlen Ave., St. Louis, Mo.
Branch Office—530-U Hudson Terminal, New York City

Prepare to Repair

Be prepared to meet the spring and summer demand for auto repairing, accessories, and replacement parts. Establish a system which will mean big profits for you and enable you to render prompt, efficient service.

UNIVERSAL BATTERY SERVICE

means this complete, comprehensive service. It means the prompt delivery of all replacement and repair parts—plates, terminals, connectors, separators, etc. It means a saving of time, money and trouble for you.

Send today for interesting 1919 catalog.

Universal Battery Company

3414 South La Salle Street

CHICAGO, ILLINOIS

Makers of Universal Starting and Lighting Batteries. A complete battery for every popular make of car and a repair part for every standard make of battery. Also manufacturers of vehicle plates and parts for both pleasure and commercial cars.

ACCES\$SORIES

By M. E. FABER.

Most of the manufacturers of the leading accessories you sell have timed their advertising to the consumer, your customer, to begin at about this time of the year.

This has been done for YOUR benefit.

It has been done with the knowledge that those accessory merchants who are out for the big business will want to take advantage of it and make it their own advertising.

Consequently, NOW is the time to make the show window talk to your customers in the same language that the manufacturers' advertisements are using. NOW is the time to watch the national magazines that circulate almost as widely among your own customers as do your local newspa-

pers, for advertisements of the accessories you carry in stock, and those that you ought to carry in stock.

Probably you read one or more of these magazines yourself. If you don't you are missing something of value, not only in the way of information that you might gain for yourself, but as a matter of knowing what the accessory manufacturers are doing to create a profitable demand for goods that you can sell at a good profit.

For instance, suppose that you see in one of the big magazines, such as the Saturday Evening Post, Collier's, Leslie's, Literary Digest, etc., a full page or a double page spread telling motorists why they ought to buy some accessory or other. You don't need to be told that a large percentage of your own customers are reading that same advertisement and that some of them

are already wondering where they can buy that particular article.

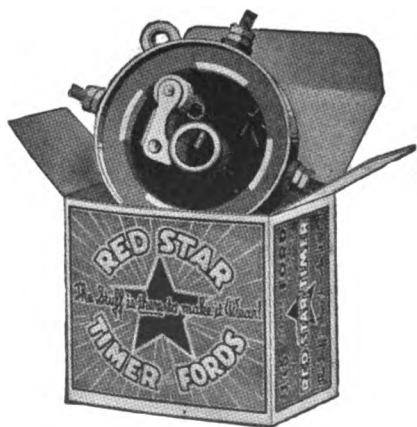
Now, it's up to you. Are you going to let them continue to wonder, or are you going to get busy and let them know by means of your window, your newspaper advertising, your conversation, that you are ready to supply them?

Many of the manufacturers make it their business to tell you in advance when these big advertisements are scheduled to appear. They can't come to you personally and tell you about what they are doing for you, but they send letters and circulars that tell you just the same thing that they would tell if it were possible for them to step into your office.

Don't overlook these important announcements. They cost money and they mean money.

RED STAR TIMER CARTON WINS MUCH FAVOR

During the last thirty days, there has been a big demand for Red Star timer cartons, states C. B. Johnson, general manager of Auto Components, Inc., Chicago, makers of Red Star timers. From one dealer,



who ordered a generous supply of timers, there came a request for one hundred empty cartons and display cards. Upon inquiry the following letter came from the dealer and is quoted in part:

"There seems to be a tendency among manufacturers to slight the looks of car-

tons that hold their goods. Some of them are atrocious. It is very hard to get material for a proper window or counter display at the best, because the ordinary package is anything but attractive.

"So when a snappy carton like the Red Star carton comes along, we feel like welcoming it with open arms and out here we are going to display it all over our store. Good looking cartons help sell goods."

STANDARD-MOTOR PEP HAS DOUBLE GUARANTEE

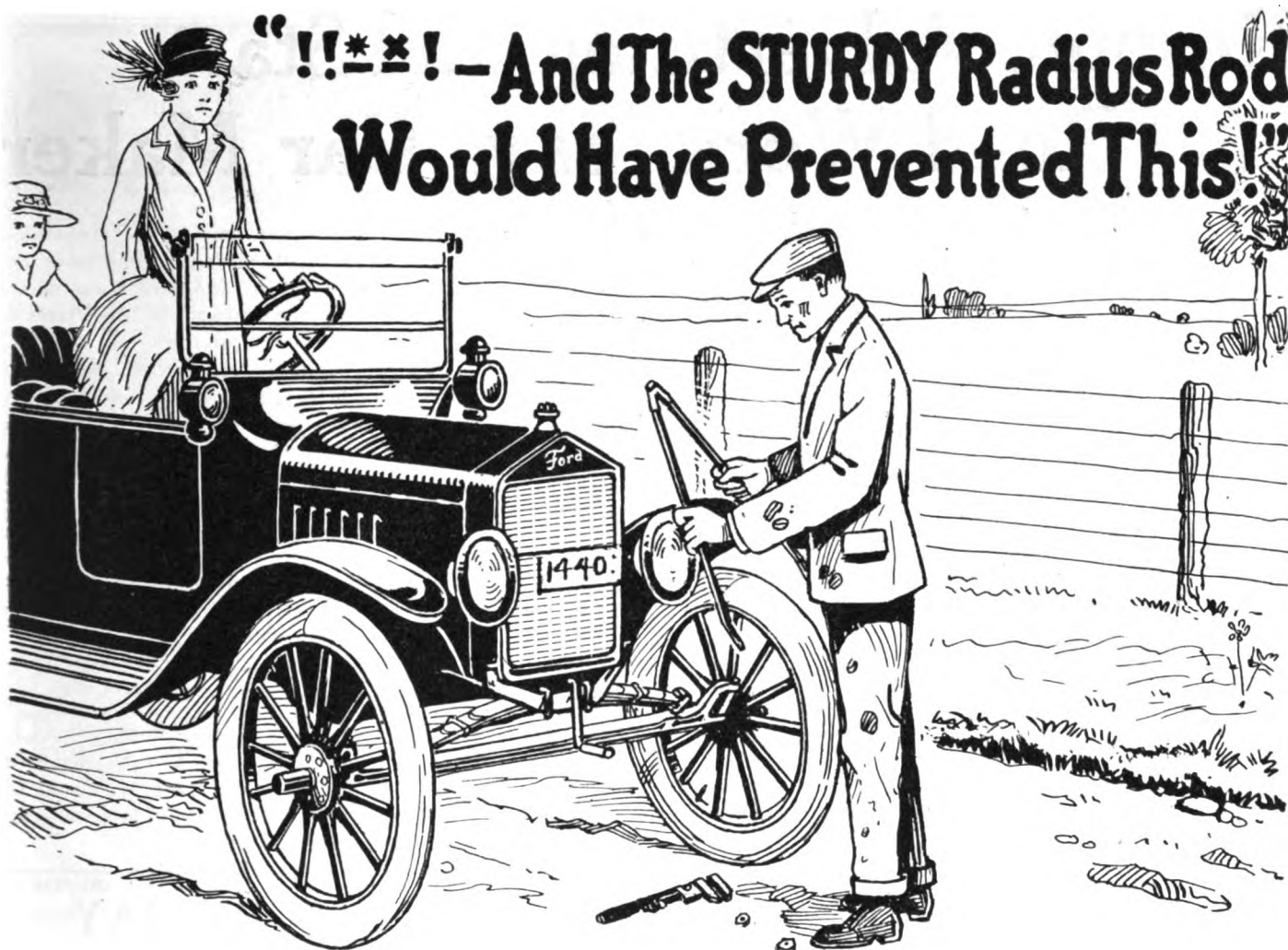
Standard Motor-Pep is winning many friends in the trade as it is backed up by two guarantees, a money back guarantee to consumers, and a sales guarantee to dealers. It is produced by the Utilities Company, 311 Citizens Building, Cleveland, Ohio, which is making a special advertis-

ing proposition to dealers. The company's offer is to send absolutely free 50 sample packages of Standard Motor-Pep, 50 eight-page testimonial circulars, and one counter or window display card printed in two colors, with each order for one dozen boxes of the preparation.

The company is so sure that Standard Motor-Pep will sell readily that it makes the following guarantee: "If any dealer, after giving Standard Motor-Pep a proper display in his store, does not sell his initial order of one dozen boxes within six months from date of purchase, the company agrees to buy back all unsold packages, that are in good condition, at the price paid by the dealer."

The company states that Standard Motor-Pep cuts fuel bills one-eighth by energizing the gasoline, provides one-eighth more mileage, gives 20 per cent more power, eliminates carbon, and gives quicker and easier starting with consequent battery saving. Motor-Pep, which is made in tablet form, is claimed to increase the efficiency of any kind of gasoline. It is packed in a convenient size box containing 100 tablets, enough to energize 100 gallons of gasoline.





THOUSANDS of Ford owners have found themselves in this predicament, hopelessly stalled—the countless little jolts and jars to which the radius rod is subjected having caused it to give way at a most inopportune moment.

Avoid the Trouble and Expense of Such An Occurrence

The STURDY Radius Rod prevents the possibility of your car being laid up for several days for expensive repairs.

It takes the strain off the crank case of the motor and puts it where it belongs—on the frame.

The flexibility of this rod insures a free vertical movement of the axle, allowing it to conform with any inequality of the road.

Makes steering easier and safer. **Price per pair \$6.00.**

Write for full particulars

Gray-Heath Company

*Manufacturers & Distributors of
Automobile Essentials*

1442 S. Michigan Ave.

Chicago, Ill.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Resume Advertising and Start Road Work, Says Car Maker

Close co-operation of industry in the natural readjustment of business to meet peace-time conditions was one of ten proposals for a reconstruction program offered at a meeting of automobile men and show managers in Cleveland by President Edward S. Jordan of the Jordan Motor Car Company.

"Step off on the right foot and resume advertising," was his advice to the automobile men. "If we are going to resume production, we must display our merchandise.

"We have the lessons of war to guide us in peace," he said. "The greatest thing that we have learned is the power of unselfish effort expressed in co-operative action. Only the autocrat at one extreme and the bolshevik at the other feels that he is sufficient unto himself and can prosper without helping others. If America hesitates to continue to co-operate in that wonderful spirit exhibited during the war, through lack of foresight and intelligent plan, it will be your fault and my fault, as well as that of the people at Washington.

Price-Cutting Reacts.

"Prices should decline simultaneously with wages, materials and overhead. Price cutting for selfish or sentimental reasons while wages, material and overhead are high, will react to the detriment of the man who starts it and the industry of which he is a part.

"If a price has been inflated and is suddenly reduced to gain a competitive advantage, sales are more likely to be retarded than helped because the public will be led to expect further reductions. There is no bottom to promiscuous price cutting. Furthermore, we are all in the same craft, going through the rapids, and woe unto the man who rocks the boat. Only a mere weak competitor may go overboard, but the public will conclude that the whole ship is headed for the rocks.

"The buyer of steel, copper, cotton, wheat, or any general commodity should be made to feel confident that he is buying at the best price that will be possible for a definite period of time, and that preferential prices to favored individuals will not be countenanced. Otherwise, there will be great hesitation, curtailed production and consequent unemployment."

In the nine other planks of Mr. Jordan's reconstruction platform, he advocates the regulation of demobilization so as to prevent unemployment and to allow a just allocation of materials, capital and labor.

"Give all war workers as well as soldiers thirty days' pay and transportation to

their homes, which in many cases are far from their present employment. Idle men in crowds in big cities present the greatest danger.

"Start immediately a program of national highway construction with standard specifications, using the present military camp equipment, trucks and supplies.

Make Tractors Efficient.

"Extend the farm credit system within reasonable limits and encourage the production of farm tractors, not with the idea of making them cheap, but more efficient.

"Organize a national movement to urge public works by state, city and federal government to provide employment for labor released from war work.

"Every line of business should seek the advice and co-operation of competent bankers in the development of plans for international trade. The first necessity is to produce goods which our foreign customers want, but a most important question relates to exchange.

"Establish a ministry of education. Thousands of children in the more isolated sections of the United States do not enjoy the same educational advantages as the children in large cities.

"Every large employer of labor should share his profits with his workers. The war has proved that we can, through co-operation between employer and employee, produce more goods with less men on the farms and in the factories.

"The task of the social and religious organizations is to broaden the scope of their service at home so as to provide means of expression for those millions of young men who learned on the field of battle the great joy of helping others.

"Henceforth every young man must have a chance. No czar, kaiser or bolshevik will be tolerated in industry. The boy who inherits money or takes it by cleverness from others will have much to explain. He who creates new wealth by hard work will lead his fellowmen."

HIGHWAYS TRANSPORT DAY

Proclamation.

WHEREAS: The ever-increasing needs of our military and naval forces abroad and at home are constantly and inevitably demanding more tonnage capacity from our railroads; and

WHEREAS: In the face of this condition thousands of tons of vegetables and fruit are allowed to go to waste annually in this country for lack of transportation, even in times of peace, while at present the world is suffering from want of food; and

WHEREAS: The call to arms has drawn thousands of young men from our farms, making the task of those left behind one which calls for every ounce of energy, increased efficiency and industry;

NOW, THEREFORE, I, JULIUS C. GUNTER, GOVERNOR OF THE STATE OF COLORADO, do hereby proclaim Friday, November 15, 1918, **HIGHWAYS TRANSPORT DAY** in Colorado, and I do call upon all farmers, merchants and others interested in transportation to meet that day in their respective communities and to consider then the serious problems which face our commonwealth in the transportation of supplies. Provided, that in any communities where Board of Health regulations prevent, these meetings shall not be held until such time as officials shall designate as compatible with the public health.

And I do further designate officers of the Highways Transport Committee of the State Council of Defense as officials in charge of these meetings, and do call upon all patriotic organizations to lend them their aid to the end that we may eliminate waste, conserve power and otherwise stimulate our efforts toward the winning of the war.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State to be affixed at the State Capitol, in Denver, Colorado, this 30th day of October, A. D. 1918.

JULIUS C. GUNTER,
Governor of Colorado.

Attest:

JAMES R. NOLAND, Secretary of State.



*The one polish I can fully
recommend because it benefits the finish—is*

Waxit "The
Perfect
Polish"



Garagemen recommend Waxit. Because they have seen the work that it does. The garageman is the one who gets the knocks. Pity him, if he recommends a product that doesn't do the work. But he recommends Waxit, because he knows it does good work and is beneficial to the finish.

Nothing else can duplicate the wonderful mirror-like finish that Waxit gives. Nothing else can match the magic-like ease with which it removes the dust and dirt—the grease and streaks.

Waxit benefits the finish. It is the tried and true polish in thousands of homes where no other polish is tolerated for the mahogany furniture or the piano. It covers up scratches and mars. Prevents checking. Keeps the varnish smooth and elastic. Use it regularly and your car will stay looking like new.

Dealers: Write for Full Size Package and Our Liberal Dealer's Proposition.

The picture at the top of this advertisement pictures a scene that is occurring many times a day. Garagemen are recommending Waxit, because it is the one polish they are *safe* in recommending. So send for full size package and full details of our proposition to dealers.

WAXIT MANUFACTURING CO.

1539 Old Colony Bldg., Chicago

WALKERVILLE HARDWARE CO., LTD.
Walkerville, Ont.
Eastern Canadian Distributors

WAXIT MFG. CO., 1539 Old Colony Bldg., Chicago.
Kindly send full size package of Waxit and your dealer's proposition.

Name
Address
City
State

Readers' Questions Answered

Fouled Radiators

Question: I have three cars of customers which are giving some trouble with heating, even when the weather is rather cool, but I cannot be sure of the cause. I have gone over the timing, the valve setting, the hose and all that and these seem to be in good shape. I suspect the radiators need cleaning, for these cars were in service more or less all winter and some at least have used all sorts of anti-freezing compounds. Will you give me some specific directions for a simple and quick way of cleaning the radiators? Will it be necessary to take them off the cars? I do not want to do this if it can be avoided, for it means time and that is valuable just now.

H. R. J., St. Paul, Minn.

Answer: You might have suspected this in the first place and saved some of that valuable time, for it is natural that a cooling system shall be somewhat fouled after a winter's use of a car and particularly when anti-freezing compounds have been used. If no trouble had manifested itself before it was almost certain the valve, timing and ignition were correct.

Cleaning a radiator is a simple matter. Dissolve common washing soda in a pail of water, as much as the water will take. Stir frequently so that all will dissolve. Then strain this into another pail. Draw off the water in the radiator and the entire water circulating system and put back the plugs or shut off the cocks as the case may be.

Now pour the soda solution into the radiator, being very careful that none touches the paint, for it will immediately destroy it and it will also destroy clothing. Fill up the radiator to within a couple of inches of the top only. This is to permit room for the water to expand and not overflow and ruin the paint when it drips. Permit the car to be used for forty-eight hours under normal use, but of course see that the water level is maintained but being careful not to fill so the expansion will cause it to overflow.

You can now drain off this solution and you will see that there has been a heavy accumulation of sediment, which has been preventing the heat from passing off. Again do not let the solution touch the paint. Now fill with cool water and again run the car a day, then again draw off the water and fill with fresh, clean water and your troubles will doubtless come to an end.

Short Circuits

Question: If there is a short circuit in my wiring system, as I suspect, how can I determine this? Is it not a fact that there are a good many causes for short circuiting?

L. D. N., Kansas.

Answer: The cause may be in the battery itself, by buckled plates or an accumulation of sediment. The former is sometimes due to charging or discharging the battery at too high a rate, while the latter is due to neglect in removing the sediment before the chamber provided for its collection becomes filled. This would be termed an internal short-circuit. If the ground is on the battery exterior, same may be caused by spilled acid, through neglect in keeping the top of battery immaculate, which can be done by treating the top with a solution of potash and covering the metal parts with vaseline.

Should the current be flowing into the external circuit, disconnect one of the battery wires and touch it for an instant to the terminal from which it was just removed. If any current is flowing a spark will be seen; if any considerable amount of electrical energy is being lost, this should be indicated on the ammeter.

Another likely place to look for trouble of this character is in the cutout, which may be closed. Also examine the starting switch, as it is just possible it may have failed to release the last time used.

* *

Hackett Specification

Question: Will you kindly publish specifications of the Hackett four touring car?

W. J., Michigan.

Answer: The Hackett motor is 22.5 horsepower (N. A. C. C. rating), 3% by 4 1/4 inch bore and stroke, force-feed and splash lubrication, and, contrary to that in the majority of motors, has rotating sleeve valve motor. The brake system is contracting service and expanding emergency, 32 by 3 1/2 inch tires, 112 inch wheel base, thermo-syphon cooling system, two unit starting system, dry multiple disc clutch, selective sliding transmission and semi-floating axle.

* *

Armature Troubles

Question: What are the effects of armature troubles, causes of same, and how may they be located?

T. S. Y., Ohio.

Answer: Results of armature trouble may be low voltage, dim lights or under-charged battery. Should the armature windings be burned out the trouble may be

due to improper regulation, soaked winding or prolonged return flow from the battery due to failure of circuit breaker contact points to open; a grounded winding is due to imperfect insulation.

Armature troubles may sometimes be located at the commutator segments, the solder attaching same having been thrown off by revolving, and this should be re-soldered electrically. A defect will be indicated by an uneven torque, and in the case of a generator may be tested by disconnecting the driving mechanism, holding the cutout points closed, and allowing the generator to operate as a motor. If all right the armature will rotate evenly and in the same direction as when operating as a generator.

* *

Treating Used Oil

Question: I have acquired a large quantity of lubricating oil taken from crankshafts of cars coming in our garage, and would thank you to suggest in your column a method by which this oil can be treated so as to be used again.

A. R. H., Wisconsin.

Answer: The only really safe method to pursue is to have this oil redistilled and this would have to be done at the refinery. As a general rule, this oil would be of little use as a lubricant because of raw gasoline that is sure to find its way in. By letting the heavier particles settle and syphoning off the oil on top, much of this liquid can be reclaimed for use in rear axles, transmissions, etc.

By the way, what is YOUR vision of what you want to be and to do and to have, tomorrow, a year from tomorrow, five years from tomorrow? The man without a vision spends himself like bird shot; the man with vision organizes his own faculty and forces so as to actualize that vision at the earliest possible moment. Don't be a drifter! It doesn't pay.

BECK & CORBITT CO. HAS LINE OF SERVICE STATION EQUIPMENT

Several well known lines of service station and garage equipment are handled by the Beck & Corbitt Iron Company for the territory around St. Louis, Mo. The concern is territorial representative for the Service Station Equipment Co., Inc., of Chicago, and keeps a very complete stock for shipment from St. Louis. This line is especially attractive to owners of repair shops and garages who handle Ford car or Fordson tractor repair business.

The Beck & Corbitt folks also handle the AMBU line for battery service stations, and are territorial distributors for Firestone demountable rims. The firm publishes a monthly bulletin, the A-Sell-Rater, and will send it without expense to any dealer or garageman who writes to the Beck & Corbitt Iron Co., St. Louis, Mo., asking for a copy.

HALLADAY

Direct Suspension Shock Absorber

*Prevents Recoil by
Eliminating the Cause*

The only way to effectively prevent recoil is to avoid the original deflection of the leaf spring.

The HALLADAY "bee hive" springs acting through levers, have over twice the range of action of any other Shock Absorber ever put on a Ford car.

By thus absorbing the shock and preventing its ever reaching the leaf spring, the recoil of the latter is eliminated by removing the cause.

No strain of any sort is placed on the leaf spring to cause bending or breaking.

This is only one of the many Halladay features—the circular explains them all. Write for it.

L. P. Halladay Company

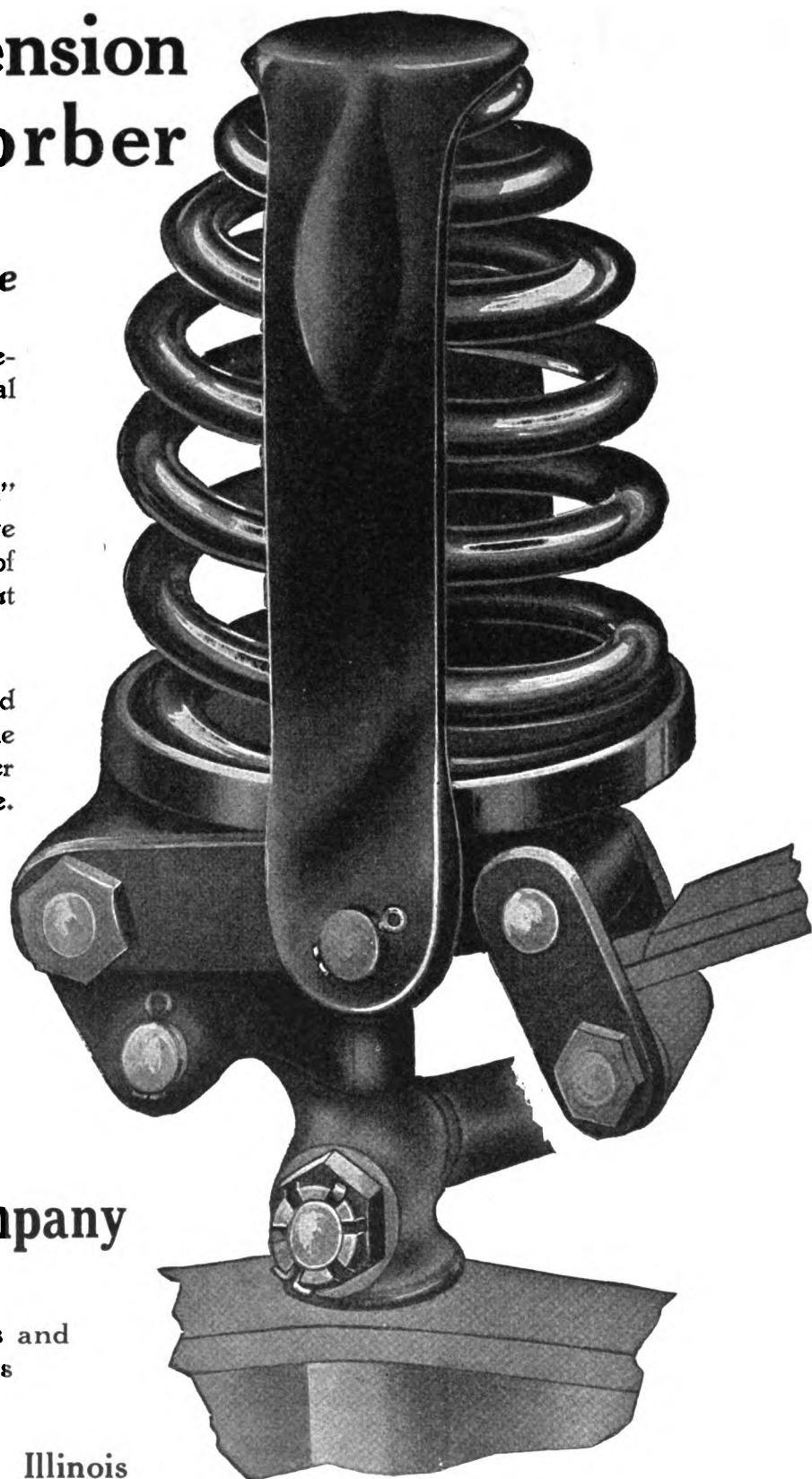
Manufacturers of

Bumpers, Shock Absorbers and
Automobile Accessories

370-380 Broadway

Streator

Illinois



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



“Hitch On” to Big Advertising and Cash in on Makers’ Outlay

By M. E. FABER.

If you are one of the accessory dealers who have had the feeling that the manufacturer was advertising because he liked to see his name in print or because he was making more money than he knew how to spend some other way—**WAKE UP.**

Big advertising is done because it is the most effective and most economical method of creating a demand for the dealer to cash in on. Any dealer can do it if he will. A trial invariably convinces the most skeptical dealer if he makes his trial a fair one.

Some dealers think so much of the value of the assistance that national advertising can be to them that they write to the manufacturers of the lines they handle and ask for the dates of the special publicity drives that the manufacturers are making. Then they practically sign their own names to the manufacturers’ advertisements by timing their sales efforts to correspond.

Other dealers even go further than this and actually sign their names to these advertisements! Sounds impossible, doesn’t it?

Here’s how. They take their little

rubber stamp or a bunch of stickers down to the newsdealer’s stand and really put their own names right on the advertisements of the lines they handle. Yes, that’s right. They go through all of the magazines and when they get through no one who reads can fail to know where he can get the goods.

Has this stunt ever been worked in your town? If not, be sure to get the credit of being the first to do it. Nothing will please the manufacturer more than to have you cash in on the money that he is investing in publicity for your especial benefit.

May Use Trucks for Short Hauls, Says U. S. Railroad Official

That the railroad of the future may find it more economical to tear up short line tracks and develop motor truck transportation in its place was the forecast made recently in an address on the future status of the railroads by C. A. Morse, assistant director of operation in charge of engineering and maintenance for the U. S. railroad administration. Mr. Morse delivered his paper before members of the New York Railroad Club and his remarks were followed with close attention as coming from one of the best known railroad men in the country.

“The perfection of the motor truck and tractor together with the universal use of the automobile, has introduced a new element into the transportation problem that should be taken into consideration at this time, while studying the reorganization of the whole transportation question,” said Mr. Morse.

“Good roads are demanded for the use of the automobile and a study should be made to see what additional expense would be necessary to so construct them that they would serve for motor truck and tractor.

Where, heretofore, development of the country for 50 miles either side of a trunk line of railroad has required the construction of light branch lines, it is a question to be seriously considered whether this policy should be continued or whether good wagon roads should be constructed and the products of farms, and passenger travel should not be handled by motor trucks and automobiles to the main line.

Few Branches Pay Expenses.

“Taken alone and considered as a unit practically none of these small branch lines pay expenses but as gatherers of freight and passengers to increase density of traffic on the main lines they are sources of profit.

“As, however, the traffic gathered by them is turned over to the main line with a deficit attached which has to be overcome during the main line movement before any profit is made, it would be a decided advantage if this traffic could be delivered to the trunk line by means of the motor truck, tractor and automobile without this bill of expense attached.”

Noting the fact that a handling would

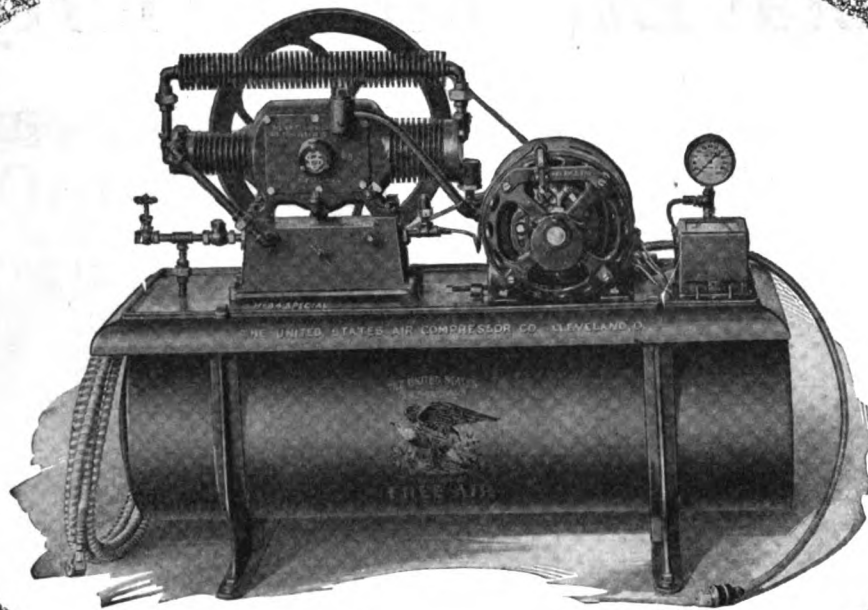
thus be obviated since it is now necessary to truck farm products to the short line branch, then transfer them to the main line, Mr. Morse continued:

Use Road Beds as Highways.

“Investigation of this subject may show the desirability as good roads are completed, of the taking up of many branch line railroads and utilizing the abandoned road bed for improved motor road, thus decreasing the expense of maintenance and operation of our railroads and giving in its place a well located motor road. Such a change would call for increased facilities at stations along the main line for passengers and for hauling freight, including storage, trackage, etc., but it would mean the concentration of supervision and labor, permitting better housing and living conditions for employees.

“Motor driven conveyances have gradually been changing conditions of railroad transportation for the past ten years, and now that the general study of transportation facilities is up for discussion, it should be taken into careful consideration, and due weight given to its influence on the economies of the situation.”

Mr. Morse closed his remarks with a recommendation that each question should be given individual study to determine whether light rail or motor truck haulage would be the more economical.



Usaco
AIR COMPRESSORS
TRADE MARK

High Pressure Requirements Have Radically Changed the Air Compressor Situation

Many Garagemen, like the Government, have found **Usaco** Two Stage Equipment Ideal for the Present Unprecedented Demands.

Many air compressors are now being discarded because present day requirements demand greater service than they were ever intended to perform.

10 to 12 inch tires are now common, carrying

pressures up to 140 and 150 pounds. To properly inflate them requires a tank pressure of from 175 to 200 pounds and obviously it is unfair to expect satisfactory service from machines designed primarily for the 60 to 90 pound tire pressure era.

The Government was the first to use these enormous tires, and naturally the first to feel the absolute need for a compressor built to a new high standard. They found it in the Usaco Two Stage Compressor—a machine that has been far superior for years than conditions have demanded.

Now, however, the Usaco Two Stage compressor is being recognized in its true light—as a machine without a par—distinctly in a class by itself.

We want to prove these facts to your own satisfaction. Write for literature today.

The United States Air Compressor Co.

6542 Carnegie Ave. Cleveland, Ohio



Send literature describing USACO TWO
STAGE COMPRESSORS as ad-
vertised in American Garage
and Auto Dealer to
address in mar-
gin.

Installs Profit Winning Display; Total Expense Is Thirty Cents

"The only expense for the display was 30 cents for the crepe paper."

The sentence quoted above is the concluding one in a letter written to the editor of this journal by Arthur C. Brown, who is employed in the Winterrowd Garage at Orange, California. Mr. Brown wins one of the \$5 prizes offered for pictures of window displays accepted for reproduction. The photograph he sent in is reproduced on this page.

What has been done in this California town of 2,920 inhabitants, according to the census of 1910, can also be done in any and all of the thousands of other big and little cities and towns all over the country.

Attractive window displays are good investments in two ways. Their greatest value lies in the immediate sales that result because motorists have seen something that they need and go into the store to buy it. Their second feature is that they possess a great deal of advertising value. When a window is attractively dressed up with merchandise it must impress those who see it with the fact that the owner of the store realizes that he has something for which there is a demand, and so uses his show window to display these wares.



Arthur C. Brown's Prize Winner.

Mr. Brown's letter of description that accompanied his photograph was as follows:

Display Described.

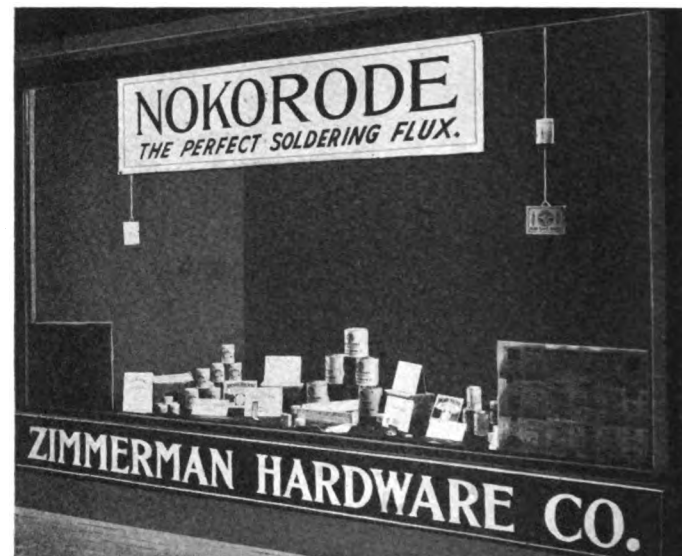
"Enclosed you will find a photograph (night exposure) of a window display I put in where I am working. The print is not near as pretty as the window because the colors do not show. The tire in the background hanging up is not part of the display, but is in the vulcanizing department.

"At each end of the window you will notice a tree. I took tin cans, filled them with dirt and got a couple of eucalyptus

branches, covered the cans with orange crepe paper. These made good end decorations. The tires are leaning against boxes also covered with orange crepe paper. On top of each box is a can of body polish.

"In the center of each casing is a can of talcum and at the side of the tires a tube in its original carton and next to the tube a blow-out patch. Two cans of radiator cement are in the center with an automobile anti-theft lock between them.

"Along the front of the window, laid lengthwise, is a Weed tire chain. This does not show in the print. The floor is covered with orange crepe paper. In the rear is a U. S. Tire



Photographic Reproduction of Nokorode Display at the Zimmerman Hardware Company's Store at Philadelphia in the Sub-Basement Subway Entrance Window. This display helped sell 66 2-ounce cans in two weeks, previous to which only 48 cans had been sold in 7 months.

Company screen. Directly in front of the screen is a flower box which I made as follows: Took a long paste-board box, covered the front with imitation oak wood, inserted five cans filled with water and put in cut flowers (geraniums, different colors). The posters in the center are advertisements of the

Firestone film, 'Careless America.'

"Since putting in this display we have noted the interest it attracted. The people here have not been in the habit of looking in garage windows; the vulcanizing department is in a garage. Sales in accessories and tires have increased considerably, and we have had many compliments on the display.

"The only expense for the display was thirty cents for the crepe paper."

Subscribers protect their interest by mentioning AMERICAN GARAGE & AUTO DEALER when writing advertisers.

When a customer assures you that he will "Think the matter over," he is usually just making an easy "get away." Say pleasantly to him, "When you have given the matter full consideration, I will be glad to have you come back and see me. I am sure we can do business." This pair of suggestions with which the customer departs, will tend to bring him back of his own accord.

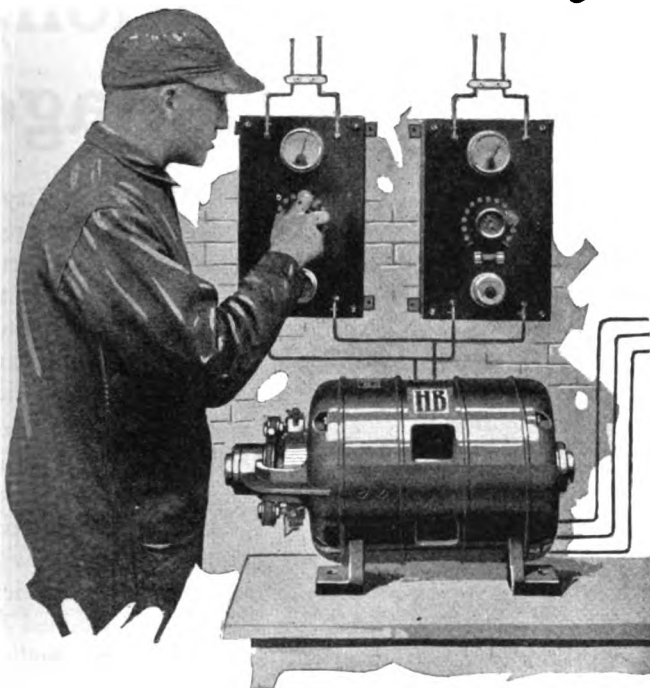
Olympian Stockholders Elect Their Officers

At the annual meeting of the stockholders of the Olympian Motors Company, Pontiac, Michigan, held recently, the following officers were elected:

President, Fred K. Parks; vice-president and director of sales, St. Clair Couzens; vice president and treasurer, Wm. Passmore; and secretary, C. E. Callender.

In addition to all the regular business of the year being discussed, including the annual report, the stockholders voted to increase the capital stock of the company to take care of increased business.

Make Battery Charging Pay BIGGER PROFITS



Use an HB 16-Battery Charger

This season it is merely a question of how much battery charging business you can handle, simply a matter of equipment. The business is here—waiting for you. Why not prepare NOW to take it? More old cars are being driven this year, with batteries in constant need of recharging. All new Fords are to have electric equipment with storage battery.

You Can Easily Clear \$150 to \$250 a Month Net Profit.

Others are doing it—why not you? It costs you 12c to 15c to recharge a battery with HB Charging Equipment, depending on the battery. The customer pays 75c to \$1.50. Quick, clean profit, easily made. At least 500 per cent on every battery charged. What other feature of your garage business pays a profit anywhere near that? Compare your profits on oil, gasoline, repairs, tires, accessories, etc., with the money you make on battery charging. And on top of that, remember that battery charging requires no selling effort, involves no expensive labor, takes up only a little waste space in one corner of your garage, and makes money 24 hours a day.

Battery Charging Will Be the Biggest Money-Maker in Your Garage.

The HB 16-Battery Charger recharges 1 to 16 6-volt batteries, or their equivalent in 12 or 24-volt batteries at one time. A profit of at least \$10.00 on each capacity run of your charger. No electrical or mechanical knowledge is required to install the HB Charger or operate it. A few minutes' time from any mechanic is all the attention it requires, save for occasional oiling. There are no delicate adjustments or expensive renewals. The HB 16-Battery Charger is sturdy and dependable, built of finest materials to stand hard, daily service for years.

HB Chargers Are the Motor Generator Type

There are many charging appliances on the market which on first impressions look good. Investigate the operating expense and the cost of parts that wear out, burn out, causing a constant source of trouble, worry and needless expense. It should mean something to you that 75% of all HB Motor Generator Chargers sold replace these fragile machines. Remember, it's not first cost that is so important to you as the monthly bills for current, repairs, renewals, etc. Remember you are buying a battery charger for years of hard service. Get an HB Motor Generator Charger and be free from all expense and trouble. Motor Generator Chargers are sturdy, dependable, and last for years under hardest usage. If in doubt, write us for full data on various types of battery charger. Buy Your Charger for Long Service and Big, Steady Profits.

\$57 Puts an HB 16-Battery Charger in Your Garage on Money-Back Guarantee

Balance in 10 monthly payments of \$23 each. Earnings will easily pay for machine as it runs. Furnished complete with 2 charging panels each capable of carrying 8 6-volt batteries. Each panel complete with ammeter, variable resistance fuses, rheostat, switch, etc., ready to install. Uses city electric power, 2 or 3 phase current, from wires now in your garage. The HB 16-Battery Charger cannot operate on single phase current. Sold on HB Absolute Money-Back Guarantee of Satisfaction. If not satisfied after using 10 days, you may return charger to us and we will refund all you have paid us. Start your battery business NOW—get those big profits. Be the first man in your locality to have an HB Charger. It will pay you handsomely and bring new business in all lines of garage work. ORDER NOW, you run no risk. Tear out this ad and mail today with your \$57 check for first payment on trial order.

Money Put in an HB Charger Is an Investment, Paying You Big, Steady Profits for Years to Come. Order on Trial Today.

HOBART BROTHERS CO.
BOX G4 TROY, OHIO

Successful Manufacturers Since 1893

In the Truck and Trailer Field Trailer Men Finish Organization; H. W. Perry is General Manager

Leading trailer manufacturers of the country completed organization of the Trailer Manufacturers' Association of America at a meeting held in Detroit March 18, when by-laws were adopted, H. W. Perry was appointed general manager and plans made for opening headquarters in New York. The meeting was attended by fifteen representatives of charter members who met at the Detroit Athletic Club in an all-day session of the members and executive committee and concluded the day's work with a dinner at the club.

A preliminary meeting to reorganize the trailer association formed before the United States entered the war, was held in Cincinnati, February 20, when officers were elected as follows: President, W. E. Ferris, Ohio Trailer Co.; first vice-president, W. A. Murfey, King Trailer Co.; second vice-president, R. C. Sykes, Troy Wagon Works Co.; secretary-treasurer, J. C. Endebrock, The Trailmobile Co.

Objects of the Association, as set forth in the by-laws, are to promote the trailer industry in the United States and Canada, encourage the introduction and use of trailers and their accessories, further the construction and maintenance of good roads, aid in securing the enactment of uniform laws relating to the use of trailers, gather and disseminate information regarding the trailer industry, and to do everything necessary and

proper to aid in the general advancement of the interests of trailer manufacturers and dealers either alone or in association with other manufacturers.

Work With Other Organizations.

It is the desire and intention of the Trailer Manufacturers' Association to work in close harmony and cooperation with other national organizations in the automobile industry, such as the National Automobile Chamber of Commerce, the Motor and Accessory Manufacturers' Association, the Society of Automotive Engineers and the American Automobile Association.

This close contact and cooperation are assured through the appointment as manager of the affairs of the trailer organization, of Mr. Perry, for the last nine years a member of the office force of the National Automobile Chamber of Commerce. As secretary of the Commercial Vehicle, Good Roads, Legislative and Export Committees of the N. A. C. C. and manager of the statistical and information department, he is thoroughly familiar with association work and has long-established close working relations with the various organizations.

For three months last year Mr. Perry was associated with C. C. Hanch, Chief of the Automotive Products Section of the War Industries Board, as assistant chief, and has recently been in charge of the Washington office of the National Automobile Chamber of Commerce.

Thus numerous points of contact with governmental activities have been established that will be advantageous to the Trailer Manufacturers' Ass'n.

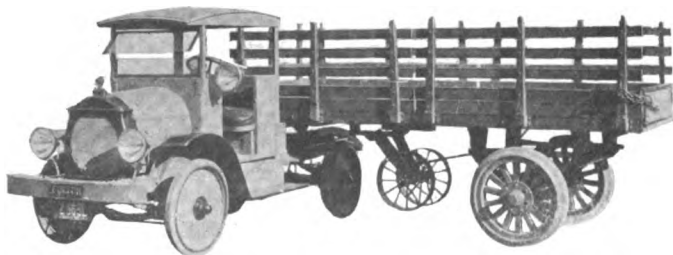
Offices in New York City.

Offices for the association are to be opened in New York City, probably in the 42d Street section, about May 1, when active work will begin toward increasing membership and carrying out the objects of the association.

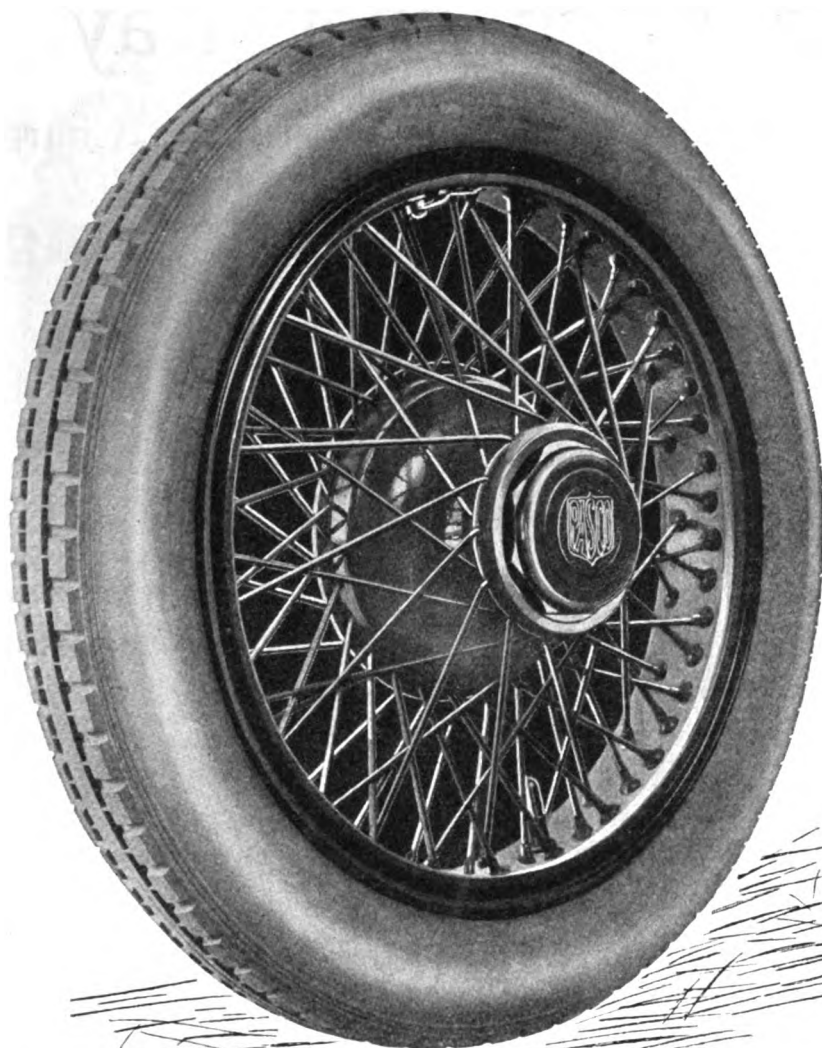
A fund was raised at the meeting to finance the work of the association, a considerable part of whose activity will be of an educational nature to acquaint motor truck owners with the many advantages and economies that are being and can be obtained by the use of trailers. The best methods of crating trailers for shipment and export are to be investigated and all kinds of data are to be gathered pertaining to the production and use of trailers, such as savings effected by the operation of trailers in various lines of business.

The charter members of the association include the following:

- Arcadia Trailer Co., Newark, N. Y.
- Detroit Trailer Co., Detroit, Mich.
- Fruehauf Trailer Co., Detroit, Mich.
- Highway Trailer Co., Edgerton, Wis.
- King Trailer Co., Ann Harbor, Mich.
- Martin Rocking Fifth Wheel Co., Springfield, Mass.
- Miami Trailer Co., Troy, Ohio.
- Northway Trailer Co., Rochester, N. Y.
- Ohio Trailer Co., Cleveland, Ohio.
- Rogers Brothers Co., Albion, Pa.
- Troy Wagon Works Co., Troy, Ohio.
- The Trailmobile Co., Cincinnati, Ohio.
- Warner Manufacturing Co., Beloit, Wis.
- Watson Wagon Co., Canastota, N. Y.



New Fulton Locomotor, a Detachable Trailer with Carrying Capacity of Three or Four Tons, Just Put On the Market.



PASCO

FACTORIES

Plant No. 1
Geneva, N. Y.

Plant No. 2
Hagerstown, Md.

The word represents "The Best in Wire Wheels." Distinctive PASCO advantages are **Standard Width of Tread**—ingenious **Spoke-lacing**, **Perfect Curb Clearance**, **Sure-Lock**, **Quick Demountable Feature**, **Indestructible Hup-Cap**, **Absolute Rust Proofing**, **Correct Elasticity**, **Staunch Construction**, **Unique System of Trueing and Balancing**, **Perfect Workmanship**, and **Splendid Coloring**.

PASCO wheels are a happy combination of Beauty and Dependability. With them a car-owner saves on gas-mileage, tire-mileage and wear-and-tear bills. Our literature goes into detail. Dealers: Learn about the PASCO Sales Plan.

NATIONAL WIRE WHEEL WORKS, Inc.

Dept. G

General Sales Office, Geneva, N. Y.

New York, 1765 Broadway
Chicago, 1120 S. Michigan Ave.
Detroit, 917 Kresge Bldg.
Minneapolis, 625 Plymouth Bldg.
Kansas City, 419 Rialto Bldg.

San Francisco, 149 New Montgomery St.
Seattle, L. C. Smith Bldg.
Dallas, 1215 Gt. Southern Life Bldg.
Atlanta
Canada, Northern Electric Co., Ltd., Montreal

How to Make the Shop Pay

Time Studies Used to Find Equitable Basis for Repair Charges and Wages of Mechanics

BY E. B. HINRICHSEN.

The method of estimating jobs had never been entirely satisfactory, as it had always been more or less guesswork. The estimates had to be loaded to a considerable extent in order to protect against loss on account of trouble that did not show during the preliminary inspection. Definite prices had been fixed for certain operations but these figures were based on general experience, rather than actual records. In a great many cases they were unjust, either to the customer or to the shop.

In order to overcome this Bill started a system of time studies covering the amount of time used in making every sort of repair. Various men in the shop were timed on certain operations and an average taken from which the price of the repair was made. It took a great deal of time to compile these but finally Bill felt that all possible operations on all makes of cars were timed. Then he and Mr. Brown got together to make up their price lists. These were made in pamphlet form and the subjects arranged alphabetically.

The testers and shop foremen received copies and were supposed to be guided by them in making estimates and prices on jobs. In order to test out the system, the testers made estimates in all cases whether the customers wanted them or not. These were carefully checked against the foremen's prices on completed jobs. It did not take long to get the discrepancies ironed out and as soon as this was done the estimates and job prices came very close together.

"Time Wasters" Cared For.

The time studies covered every possible piece of work, even to putting in gasoline and oil or running the cars on the elevator. While these little "time wasters" were not actually charged, they were taken care of in other associated operations. Mr. Brown never let up on this. He was constantly urging Bill to find more places where leakage occurred and devise methods of stopping the leaks.

These stunts were more or less irritating to the mechanics, who had been accustomed to a loose, hit-or-miss system such as is practiced in most shops. It was hard to make a man understand why, when he wanted three bolts of a certain size he should not take six and drop three of them in his tool box for future use. Also why when he wanted six cotter pins he should

not take a handful, but steady driving at it finally brought them to tolerate the system, if not to like it.

After the time studies were complete, the piece work system was slowly put into effect. It was done carefully and closely watched all the way. The simplest and most standard work was first put on a piece work basis and gradually added to until practically all the operations were both paid for in the shop and charged to the customer on a work, instead of a time, basis.

Piece Work Speeds Production.

There is nothing like piece work to speed up production. Pay a man a certain price for a certain operation and his earning power is limited only by his ability and industry. It also gives to him an incentive to think, as he is constantly on the lookout for some method of cutting time on the work. It promotes a better feeling in most cases as there is no question as to wages.

Quite often in time work an injustice is worked when two men are paid at the same rate and one does a good deal more work than the other. Of course, it calls for careful supervision and inspection but on the whole, it pays. It cannot very well be done successfully in a very small shop or one where the work is not steady. But as soon as it gets steady enough to be in the production class, piece work does pay both employer and employee.

Methods somewhat similar in practice were put in operation in the parts department. A great deal of time had been lost in finding out just what part a customer wanted. He often failed to bring the old part with him and it was difficult for him to pick out the piece from the parts books. The parts men would waste time bringing various pieces from the bins.

Chart of Parts Pictures.

Bill had charts made which hung in the room outside the parts windows. These charts showed actual size pictures of all parts and were arranged in groups such as motor, transmission, rear axle, etc. These were of the greatest help in saving time for customers and parts department employees.

They also adopted the plan of charging a certain percentage on new parts returned. The returning of new parts is probably one of the greatest causes of loss in a parts department. A customer buys a number of pieces that he thinks he may need on a job and later wants to return some of them. The cost of the clerical work

involved in drawing and returning these is often more than the profit on the entire sale.

If a certain charge is made for returning—enough to cover the cost—the customer becomes more cautious and exercises greater care in making his purchases. The parts department is protected against this loss. When the reason for this is explained to the purchaser, there is seldom any ill feeling on account of it.

Electric Sign Is Almost Necessity to Business

With the coming of spring automotive sales agents and garage men are giving much thought to ways whereby their store fronts can be made more attractive, for they realize that no matter how good the service, it is the outside view that first catches the attention of the passing motorist.

One thing that has become almost a necessity is an electric sign.

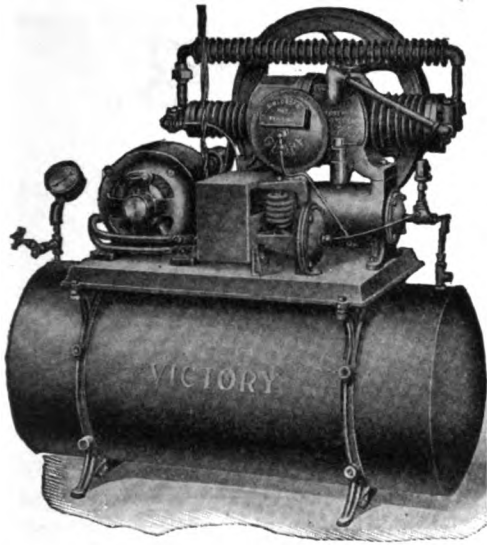
There are signs and signs. Everything from elaborate electric displays to small signs shouting forth one word, and the question is which is best. Officials of the Flexlume Sign Co., Buffalo, N. Y., who for years have been giving considerable attention to the subject of electrical advertising as applied to the needs of the automobile trade, place design ahead of size in answering this question.

In most cases a comparatively small sign of the Oplex type—raised snow-white letters on a dark background—has more advertising value than an ordinary sign of twice the size, by reason of the fact that each letter stands out a solid unit with unbroken outline. There is also the advantage that the raised white letters standing out from a darker surface make an ideal day sign as well as a night sign.

Oplex Signs in All Sizes.

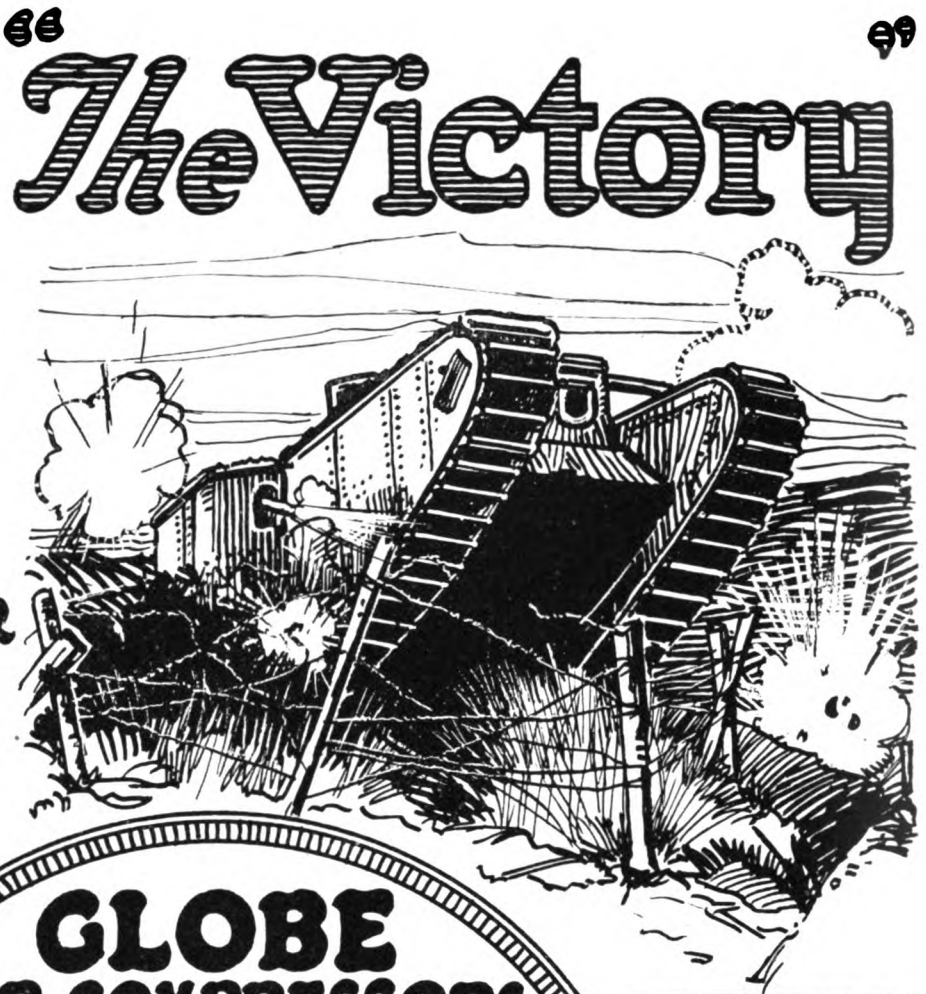
These Oplex signs are made in all sizes, shapes and designs varying from small signs showing simply the one word "Garage" up to large displays of several lines. Many of these signs suitable to the automobile dealer or the garage man have been standardized so that they can be bought at a much lower price than if specially made.

The Flexlume Sign Co. has published a little book on the subject of electrical advertising. "Twenty-four Hours a Day," which will be sent free on request.



This
AIR COMPRESSOR
has won its way
to supremacy

The "VICTOR" is a complete Motor Drive Compressor Unit substantially mounted on steel air storage tank, making the most compact, attractive and serviceable Automatic Air Equipment. Unequalled for free air stations.



GLOBE **AIR COMPRESSORS**

As the armored tank was an innovation in modern warfare, so Globe Equipment produced a new and higher standard in Free Air Service.

GLOBE COMPRESSORS give a service that is most satisfactory to the motorist, and the most economical in upkeep to the garage owner.

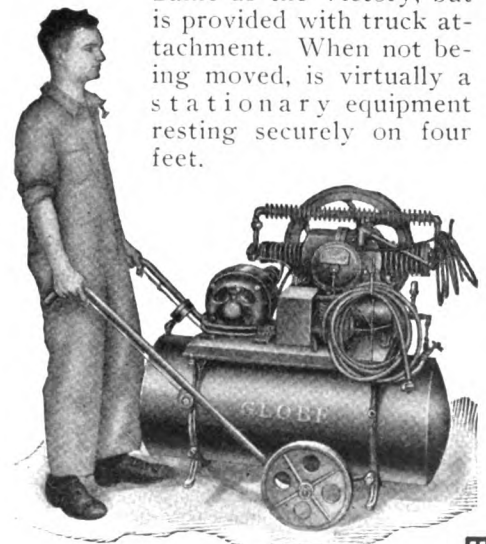
Designed and standardized according to actual operating conditions, they give rapid, dependable service under all conditions.

Made of the finest materials, with the most expert workmanship, they operate consistently for long periods, with little or no attention. Rapid, reliable free air service is essential to the first class garage. Globe Air Equipment will enable you to give a service that will bring you good will and big returns. Write today for particulars.

Globe Mfg. Company
BATTLE CREEK — MICH.

VICTORY PORTABLE

Same as the Victory, but is provided with truck attachment. When not being moved, is virtually a stationary equipment resting securely on four feet.



Tractors and Farm Lighting

A production of 314,936 tractors in the United States in 1919 is estimated by manufacturers reporting to the Office of Farm Equipment Control, United States Department of Agriculture. The reports obtained in a special inquiry by the department show a production of 132,697 tractors in 1918.

The manufacturers gave the number of tractors of different sizes manufactured last year and estimates of the number of each size that will be made this year. The figures for 1919, of course, are merely estimates and represent the aggregate of the estimates submitted by the tractor manufacturers in January and February of

this year. A summary of these reports follows:

On hand Dec. 31, 1917, 15,525.
Manufactured during 1918, 132,697.
Sold in U. S. during 1918, 96,470.
Sold for export during 1918, 36,351.
On hand Dec. 31, 1918, 15,401.
Manufacturers' estimate of production for 1919, 314,936.

Number of Tractors of Different Horsepower Manufactured in 1918.

| Makers' Rating Belt Horsepower. | No. of Tractors. |
|------------------------------------|---------------------|
| 9, 10, and 12..... | 1,141 |
| 16 and 18 | 20,629 |
| 20 and 22..... | 72,238 |
| 24, 25, and 26..... | 20,616 |
| 27, 28, 30, and 32..... | 6,959 |

| | |
|-------------------------|-------|
| 35 and 36..... | 2,212 |
| 40 and 50..... | 1,331 |
| 60, 65, 70, and 80..... | 913 |
| Not given | 6,658 |

Number of Tractors of Different Horsepower Which Manufacturers Estimate They Will Produce in 1919.

| Makers' Rating Belt Horsepower. | No. of Tractors |
|------------------------------------|--------------------|
| 9, 10, and 12..... | 8,220 |
| 16 and 18..... | 48,545 |
| 20 and 22..... | 157,671 |
| 24 and 25..... | 40,875 |
| 27, 28, 30, and 32..... | 27,465 |
| 35 and 36..... | 5,435 |
| 40, 45, and 50..... | 1,780 |
| 60, 65, 70, 75, and 80..... | 1,536 |
| Not given | 23,409 |

Practical Hints for Shops

In case it may be desired to paint or repair a top without leaving the car in the shop, construct a rectangular wooden support, notched at necessary intervals to hold the top irons, then place the top on this framework.

* *

That a shop may be properly ventilated without causing a serious draft on the mechanic, can be accomplished with the use of a piece of old windshield glass, held in an inclined position on the sill by two triangular supports. With the aid of this, the window may be raised without an accompanying draft.

* *

To clean brass parts; such as pet cocks, carburetor parts, etc., dip them into the following bath: Nitric acid, 75 parts; sulphuric acid, 100 parts; lamp black, 2 parts, and salt, 1 part. This solution should be mixed and kept in an earthen or glass jar, and the parts thoroughly rinsed and dried after dipping.

* *

A roughly made table covered with tin or zinc, with a well in it for holding kerosene, makes a most convenient arrangement for cleaning parts. A drain can also be installed at the bottom for removing sediment.

* *

A very useful pinch bar which can be used for a number of purposes, such as removing gears and flanges when no puller is at hand, can be made from an eighteen-inch length of $\frac{3}{8}$ inch cold rolled steel,

forged flat at one end, and bent into a right angle wedge at the other. Both ends are then case hardened to promote durability.

* *

If it is desired to ascertain whether a switch is short circuited, or whether one or both of the wires have become detached, press a knife blade through the insulation of both wires leading to the switch, which process will not harm the insulation sufficiently to cause trouble.

* *

Much superior to waste for removing dust from a motor is a painter's brush that is thick and soft. There are so many small projections about a motor that the use of waste is quite apt to serve as an incentive to bad language, and little else.

* *

In fitting a new carburetor be sure that there is no looseness to cause vibration, because if there is it is quite apt to result in a broken flange. If vibration prevails, a small iron bracket should be installed from a nut on the frame of the engine to the instrument, which should steady it, also taking the strain off the intake pipe.

* *

Battery terminals that have become corroded can best be cleaned with a strong solution of washing soda, and after being allowed to dry the terminals should be coated with vaseline.

* *

A very commendable home-made vaporizer may be constructed with wire cloth

(of the same kind used in milk strainers), by placing a section of it on both sides of the gasket between the carburetor and the intake manifold. This serves to break up the fuel into finer particles, which operation will materially assist vaporization.

* *

A very good suggestion for avoiding the usual difficulty in cutting gaskets is to place the material—asbestos, felt, paper, etc.,—over the hole for which it is being cut. Take a ball-head hammer and place material over the hole, then tap this, first hammer gently with another hammer and the gasket can be cut without the frayed edges that are so annoying.

* *

In case grease leakage from the hubs and brakes of the rear axle becomes chronic, it may be obviated by drilling quarter-inch holes in the under side of the housing close to the outer ends. These holes will allow the excess grease to leak out on the road.

To overurge a customer is to make him fight shy of you at all future times. By your manner and words show that you value what you are offering him very highly, and that you do not have to overurge customers because there are plenty who see the advantages and are ready to do business.

Dealer's Big Responsibility In Supplying Auto Springs

ON the spring depends the comfort and safety of all future riders in the automobile.

On the spring also depends the cost of the car's future upkeep. For the operation of the engine and mechanical parts as well as the life of the tires is vitally affected by the action of the springs.

But though the dealer's spring problem is serious, it is not difficult of solution. A standard has been established and maintained in the manufacture of

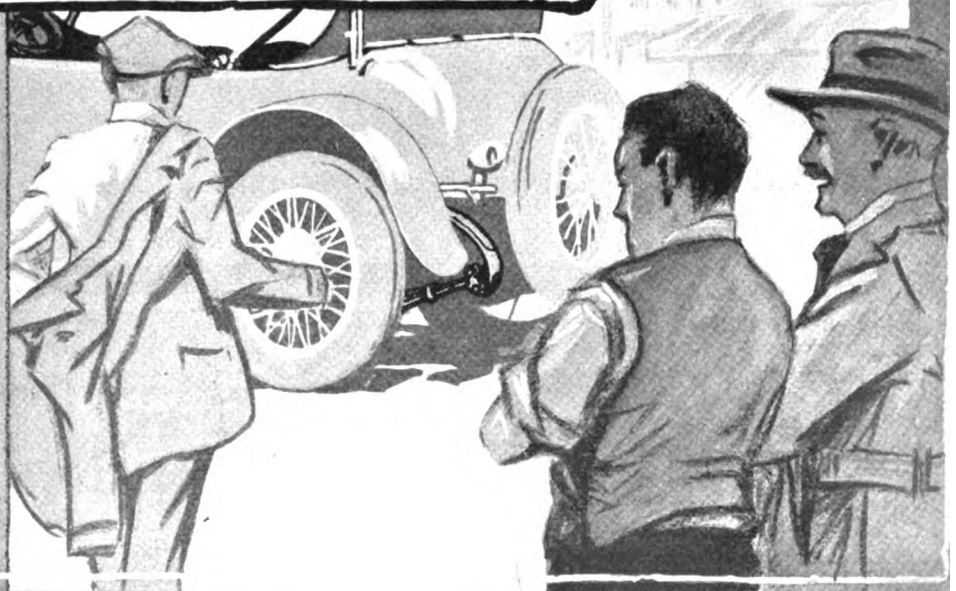
Harvey Springs that assures perfect satisfaction and service from them throughout the life of the car. And the dealer can supply these superior springs without any sacrifice of convenience or profit.

Harvey Springs have set the standard of the world for easy riding and strength.

The dealer who supplies any other, risks much with no gain.

Write for free Harvey Spring book containing specifications for more than 900 Harvey Springs

Harvey Spring & Forging Co.
1044 17th STREET RACINE, WIS.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Mechanical and Engineering Problems

BY E. B. HINRICHSEN.

Gauge to Test Cylinder Compression

Question—I would like to know what kind of a compressor gauge is used to test the compression of gasoline engines and where I can obtain one.—R. C., Iowa.

Answer—The gauge I usually use is made from an old low pressure steam gauge. This is used in connection with either of two threaded pieces of pipe. The gauge will screw into either of these pipes but the other ends of the pipes are threaded for $\frac{1}{2}$ inch and $\frac{3}{8}$ inch.—S. A. E.

In order to test the compression of a cylinder I remove the spark plug and screw in the short pipe and gauge. I have seen compression gauges made in a great many different ways, even with the gauges. I think you will find that most up-to-date accessory concerns carry them in stock.

* *

Faulty Compression

Question—I have been having a lot of trouble with my Overland touring car ever since I got it. I can't get it to hold compression. I thought it was the valves and I had them ground. This would seem to help for a few days and then it would be as bad as ever. I could not get the engine to hit except at high speeds. When I slowed down the engine would miss and the car would jerk. I did not know anything about a car at this time and had a lot of trouble.

Every time I would go to a garage they would grind the valves. I finally got mad and tore it down myself. I found that the rings had never fitted the cylinders properly. I put in new rings and the engine ran better for a while and then got bad again. I tore down again and found the same trouble.

What I want to know is this: Can I get a ring that will expand enough to stay against the cylinder walls, or can I use springs inside the rings? I have been advised to do both these but I am afraid that if I get the rings with too much spring that the cylinder walls will wear too fast.—J. B. A., Texas.

Answer—There are rings on the market that have more spring than the ordinary rings and there are also springs made to put under rings. There is a ring made that has a very strong spring as part of itself. Any of these devices might help but I believe that the first thing to do is to find out whether your cylinders are perfectly round. If they are not, rings alone will not wholly overcome the trouble.

I do not think that rings with extra spring will cause undue wear on the cylinder walls. Personally, I like them as tight as I can get them and I have never noticed that they did any damage if they were properly fitted.

* *

Spark Plugs

Question—I have been trying out a number of different types of spark plugs with the idea of stocking one certain kind when I found the right one. I am wondering if you will tell me what you think about these general types:

1—Those made in one piece and which cannot be taken apart.

2—Those made so they can be taken apart.

3—Those with mica cores or a combination of mica and porcelain or those with porcelain cores.

4—Those with a hollow porcelain or those with a porcelain made in a point.

5—Those with only one side point or those with two or more side points.—M. Auto Co., Ill.

Answer—I think you will find that any of the plugs made by a reliable concern will give you good results. I do not know of any hard and fast rule you can go by. I have fooled myself a good many times on plugs thinking I had found the ideal one only to discover later that the good results were traceable to something else and that another plug would have done just as well.

1—These cannot be taken apart for cleaning, but are sure not to leak and can be cleaned by using a device now on the market for this purpose.

2—These can be taken apart for cleaning and the porcelain can be replaced when they break. There is, however, always a possibility of leakage.

3—It is largely a matter of choice. They are all good.

4—Same as for No. 3.

5—It does not seem to me that the additional point or points are any great advantage. Unless the points are set absolutely the same the spark will only jump from the one nearest the center electrode and a fouling of one gap will put them all out of business. You have the advantage of having spare side electrodes if one of more should get burned or broken off.

* *

Stationary Engine Spark Trouble

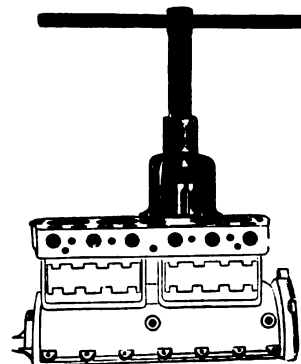
Question—We have a stationary, one cylinder engine on which we cannot get a good spark. We use an ordinary coil with a vibrator and lately it has quit us.

We have had new points put on and it buzzes all right but the spark is very weak and will not fire the engine. When it first failed we put on new batteries and it ran for a little while and then quit again and another set of new batteries did not help. What do you suppose is the matter with it?—C. S. W., Nebraska.

Answer—The insulation on the secondary winding is probably broken down, allowing the high tension current to go to ground, probably through the grounded side of the primary winding. It is quite likely that it can be repaired but it would hardly pay. Better get a new one. They can be purchased almost anywhere and are not expensive.

DAVIS REBORING REAMER FOR FORD CYLINDERS

The Davis cylinder reboring jig and reamer for reboring Ford cylinders is proving popular with repair men who have much work on Ford cars. The Hinckley Machine Works declare it is an established fact that old cylinders that have been through months of alternate expansion and contraction, due to heating and cooling in service, are seasoned out, and are much superior to new castings. The Ford Company will furnish pistons 1-32nd inch over size and the Davis outfit rebore cylinders to fit these pistons, and make them operate efficiently.



Some of the reasons given by the maker why repair men should buy and use the Davis outfit are: 1—A properly fitted piston is the most important repair for an old motor. 2—You stop the knock and piston slap due to pistons not properly fitting the boring. 3—This means more power for hill climbing and pulling through mud on high. 4—You use less lubricating oil. 5—You stop the fouling of spark plugs. 6—You use less gasoline. 7—You stop all overheating due to bad mixture caused by leakage upward from crank case on intake stroke. 8—You can set the carburetor easily to give a snappy, speedy motor. 9—One cut does the job and leaves a "gun barrel" finish. 10—You make your customers happy, and increase the earning power of your shop. Full details and trade prices can be obtained by writing to the Hinckley Machine Works, Hinckley, Ill.

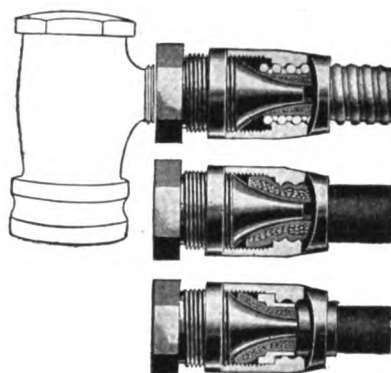
NEW WILKINSON VULCANIZER PLACED ON THE MARKET

The new model steam vulcanizer just put on the market by the Wilkinson Vulcanizer Mfg. Co., San Bernardino, Cal., represents the latest development in the Wilkinson dry cure process. It shows the new non-skid matrix and the maker claims that with its use the tire man is able to rebuild an old casing into an apparently new tire, adding from 2,000 to 5,000 additional miles at a very nominal cost.

The machine is equipped with the latest Wilkinson features, including the aluminum non-skid or ribbed tread matrix and the radiating insulated flange to protect the tire from overcuring at the laps. It requires no separate boiler as it has a boiler self contained and is fitted with steam safety valve and gauge.

ROMORT PRODUCTS

ONE COUPLING To Meet the Demand for ALL SIZES



The ROMORT Universal Air Hose Coupling takes all sizes of hose from $\frac{5}{16}$ to $\frac{3}{4}$ inches outside diameter, whether plain or armored.

The other end of the connection is a $\frac{1}{4}$ inch pipe thread and fits all ROMORT Automatic Air Valves or other connections with standard $\frac{1}{4}$ inch pipe threads.

The ROMORT Universal Coupling can be changed from one size of hose to another size at any time.

This is an ideal proposition for jobbers and dealers.

Instead of several different sizes to carry in stock, there is but one size ROMORT Universal Coupling.

Write for details.

Factory Sales Representatives
THE ZINKE COMPANY
 1323 S. MICHIGAN AVE., CHICAGO, U.S.A.
Manufacturers
ROMORT MFG COMPANY
 OAKFIELD, WIS., CHICAGO, ILL.

Welding, Cutting and Brazing

Automobile Welding

BY DAVID BAXTER.

During the succeeding months a series of articles will be run in this department under the general heading of automobile welding. These articles are to cover the different parts of an automobile with explicit instructions for welding each part. Each part will be dealt with in separate articles and illustrated with photographs and drawings.

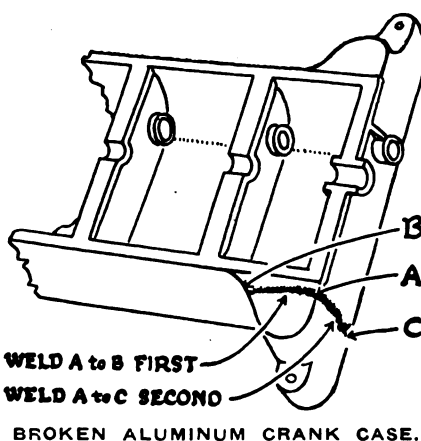
I will endeavor to take the welding of each job a step at a time and to make each one clear enough that a beginner in the art of welding may weld the same kind of job. This series will at first concern chiefly broken or cracked castings, but will later on take up special repairs, such as building up worn shafts, etc. If there is any special part any reader wishes to have discussed please feel free to write to this department; I can probably arrange to run your job ahead of one already planned.

ALUMINUM CRANK CASES.

Broken aluminum crank-cases are one class of job that is likely to come into any welding shop and especially the garage shop. Aluminum was formerly considered very difficult, if not impossible, to weld successfully. But such are the advances that have been made in the art of welding that it is now regarded one of the easiest metals to handle.

Welding crank-cases might properly be divided into two general classes, viz.: those having an outside break, and those with an inside break. The former meaning those where the fracture is located in one or more of the arms, or other projection; such as bosses, flanges or lugs. The latter meaning cases where the fracture is in the body of the casting—in the side walls, ends, or top of the casting. The first, a break not entirely surrounded by metal; the second a break surrounded on all sides by the metal of the casting.

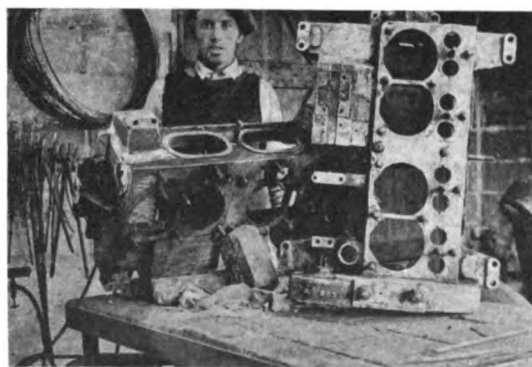
One of the commonest forms of outside break is a cracked or broken arm. The crank-cases shown in the accompanying photographs were all three broken in the arm sections; the only difference being in the distance of the fracture from the body of the case, except that one was cracked in a long arm while the others were cracked in short arms. Neither crank-case had the arm completely broken off. Had such been the trouble, however, there would have been no difference in the welding process except that the loose arm would need to be clamped in place, or



otherwise arranged until partly welded to insure a straight job; that is, to prevent a warped and distorted casting.

Pre-Heating Not Needed.

Cases having the crack located in the arm are probably the easiest kind to weld because the fracture is located where there is nothing to retard or prevent expansion and contraction; the weld can push the arm away from the main casting and draw it back again without interference. This does away with that tedious and particular process—pre-heating. Or, in other words, if the crack is located in the arm, or at the juncture of the arm and body, it is not necessary to heat the casting previous to welding, to expand it in order to prevent the heat of the welding flame from causing it to crack. It is a simple precaution, however, to warm a portion



WELDED CRANK CASE.

of the casting surrounding the fracture, with the welding flame, especially in winter.

Aluminum jobs like those illustrated may be welded cold, or practically so, because the expansion of the metal caused by the heat of the welding flame pushes the end of the arm outward. Then when the weld cools and contracts the arm is in effect drawn back to the body; again with nothing to prevent it. According to

this we see that expansion and contraction are practically nil. And with it out of our way we can proceed to weld with only the fusing of the metals to worry about.

Ordinarily, two pieces of melted aluminum will not flow together, as with other metals, but will tend to repulse each other, so to speak, or to creep apart. This is caused by a thin skin of oxide forming on the surface of the melted metal due to the oxygen of the atmosphere. This action takes place almost as soon as the metal is melted; the melted metal immediately loses its smooth silvery look, which changes to a dull, rough, gray as the surface is affected by the air.

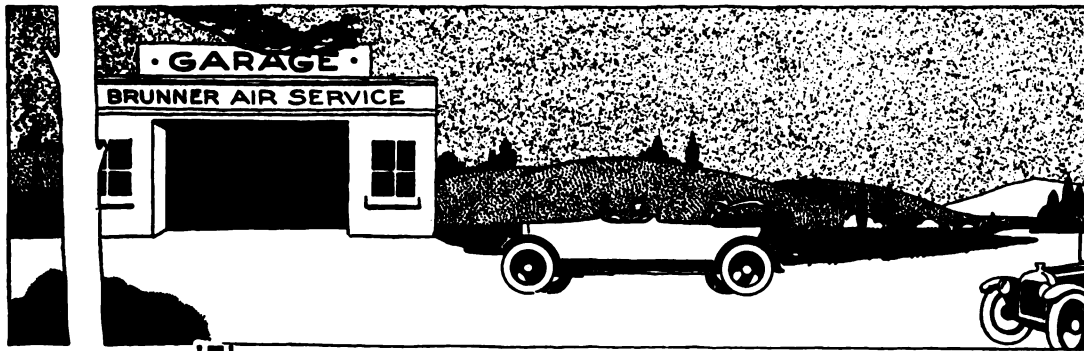
To successfully weld aluminum we must prevent or overcome this oxidization. One of the usual ways to do this is by the use of a good flux powder applied to the weld as the metal melts. Under its influence the metal will retain its mirror-like appearance longer and will fuse more readily, although it very often has to be assisted by "puddling." Puddling consists of patting or paddling the melting edges to cause a proper fusion. In other words: hastening the mixing of the edges of the fracture.

Hold Flame Diagonally.

The flame is held diagonally along the crack, tending to throw the heat along the break but not directly into it; close to the metal at first and raised slightly as it starts to melt. As soon as the aluminum shows signs of melting the aluminum filler rod is brought in connection with the flame. When it reaches the melting stage it is dipped in the flux and rubbed along the melting fracture, receiving a twisting motion at the same time. The idea is to work the melting filler into the melting weld, thus joining the sides of the crack.

The weld is confined to as narrow a strip as possible in order to lessen the amount of oxide with which to contend. Make the weld of a crack not over three-quarters of an inch wide if possible to do so. After an inch or so of the crack is melted with the filler added, the filler rod is put aside and the puddler taken up, meanwhile the flame is played around over the weld to keep it hot.

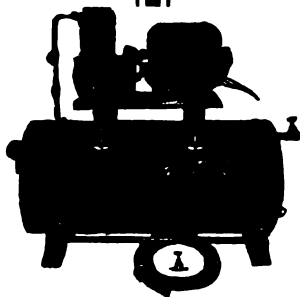
The puddler is a small paddle made flat by hammering one end of a quarter inch round iron rod. It is manipulated to pat and push the metal until the edges of the fracture are one mass. Care must be taken not to be too rough with the paddle as it is very easy to push a hole through the casting. Also watch the flame or else a part of the weld may get too hot and fall out of the casting; keep the flame revolving in tiny circles to distribute the heat. The puddling being complete the



BRUNNER Air Compressors



This is the Enam-
eled Steel Service
sign furnished free
to Brunner users.
It is a business
bringer.



No. 542 is a com-
plete unit ready
to use—correctly
designed and
properly assem-
bled. Full speci-
fications in catalog.

A Brunner Outfit is always on the job—never out of order—never refuses to work. It is economical—your mechanic's time is not wasted keeping it working—and the operating cost is small.

On a Brunner Compressor there's no need for extra equipment to aid the motor—no restriction of lubrication to pull down the efficiency, increase the wear and run up large electric bills.

An automatic controller maintains a proper working pressure at all times—the patron is not kept waiting for air.

Brunner Compressors are built to give day in and day out service under the hardest working conditions. They are made for long wear—the bearings are as carefully made and fitted, cylinders as carefully ground, piston rings fit as perfectly, as in a high priced automobile engine.

The Brunner Compressor gives your patrons the best service. Have this dependable, economical air system in your garage.

*Write for illustrated booklet and
name your jobber.*

BRUNNER MANUFACTURING COMPANY

General Office and Plant
UTICA, N. Y.

Cincinnati Branch
CINCINNATI, O.

paddle is dropped and the filler rod taken up again. The process is repeated by melting another inch or so of the metal and filler, and puddling it likewise.

The flux should be applied to the weld frequently; whenever the mirror surface begins to fade. If a helper is assisting the welder he may sprinkle pinches of the powder over the surface as needed. The melting and puddling is best accomplished an inch at a time the entire length of the crack; the process should be continuous, however, and not a series of jerks. Some skilled operators employ the filler rod as a puddler, and to scrape away slag and oxide from the weld.

Apply Flux Constantly.

Some of the factors of successful welding on aluminum are the maintenance of regularity in the flame; the constant motion of it and the constant application of good flux; also, the weld should proceed without interruption. Do not stop in an endeavor to doctor a bad spot, let it alone until the crack is welded and then go back to it, re-flux and re-puddle it. But to be more specific let us take one of the crank-cases illustrated and follow the welding from the beginning.

Take the one resting on its side, in the picture showing two crank-cases. This one shows the weld along the top of the arm and across one end. First, the job was prepared by washing the crack with gasoline, then the surface adjacent to the crack was rubbed bright with emery cloth. No V-grooving was done as this is useless on aluminum under a quarter of an inch thick. The flame was applied to the outer end of the crack lying along the top of the arm. A neutral flame was employed. Expert welders may use a slight excess of acetylene on aluminum but a neutral flame is the safe one.

The welding was first done across the top of the arm an inch at a time as described above—puddling and fluxing. The top crack was welded first because there is less danger of distortion due to the end crack allowing some play for the expansion and contraction. It is obvious that had the end crack been welded first both sides of the arm would have been fastened, thus not permitting the reactions to act normally.

No pre-heating was needed, except a little warming of the opposite side of the arm; this was done with the welding flame, for the purpose of balancing the heat on both sides of the arm. During this step of the process the crank-case rested upon its side braced with fire bricks as shown. As soon as the top crack was finished the case was stood on end upon the floor and the end crack welded after the manner described. The weld started at the corner and was worked toward the open end of the crack. This would not perhaps be advisable on a crack a foot or more in length because of the danger of the ends overlapping.

File the Weld Smooth.

Some crank-case jobs require careful covering after welding to prevent irregular cooling, which results in cracks due to unequal contraction. This job, however, required no covering but was allowed to cool on the table; it could have been placed in a corner out of the way without danger to the job. In event of a doubt existing it is better to throw a sheet of asbestos paper over it until cold. After the job has been cooled to a normal temperature the weld should be filed and chiseled clean and smooth as it gives a better appearance and creates a better impression of the reliability of the weld.

A number four tip was used to weld this job in conjunction with a three-sixteenth aluminum filler rod. A patented aluminum flux was used as a deoxidizing agent. All three jobs were handled in a like manner. Had one of the arms been broken entirely off the casting would have



SHOWING WELD ON BROKEN ARM.

been placed upon the leveling table to make the first weld across the top. The arm would have been wedged and blocked in place to insure a correct fit when the case was attached to the automobile frame. A little carelessness in this detail will cause much trouble after the job is welded so it is better to be sure about the leveling.

In absence of a leveling plate the welder should fasten the arm in correct position with strips of flat iron and bolts. Then weld across the top of the arm first the same as for the cracked arm, after which remove clamps. Then weld the inside crack toward the open end, following with the outside crack, or end crack, last; this also toward the open end of the crack, as described above. The position of the case should be changed with each weld to bring the line of welding horizontal. This facilitates the work and lessens the danger of an inefficient weld.

If two or more arms are broken off it is only necessary to weld each one in turn

the same as described above. However, it will probably be better to allow each one to cool before attacking another; there will then be no danger of strains setting in. If the operator is a rapid welder it is not necessary to wait for them to cool as he welds so quickly the heat has but little opportunity to spread to the body of the casting in any dangerous degree.

Work rapidly and deftly and you will have no trouble welding aluminum crank-cases with cracked or broken arms. Use flux and puddle until you are proficient in welding this peculiar metal.

Pulcher Heads Committee to Run Motor Truck Shows

Martin L. Pulcher, vice-president of the Federal Motor Truck Co., has been appointed by President Clifton, of the National Automobile Chamber of Commerce, as chairman of the Motor Truck Show Committee to arrange for proposed exhibitions of motor trucks in New York and Chicago next winter during the same weeks as the National passenger car shows. With him on the committee will be A. J. Whipple, general sales manager of the Diamond T Motor Car Co., Chicago and David S. Ludlum, president of the Autocar Co., Ardmore, Pa.

To better care for the increasing activities of the truck makers and enable them to work in still closer co-operation, President Clifton has appointed as additional members of the Motor Truck Committee, David C. Fenner, of Mack Bros. Motor Car Co., and R. H. Salmons, of the Selden Motor Vehicle Co. Others on the committee are: Windsor T. White, chairman (White), Victor L. Brown (Sterling), M. L. Pulcher (Federal), George M. Graham (Pierce-Arrow), Alvan Macaulay (Packard).

F. W. Fenn, who has handled the Rural Motor Express department of the N. A. C. C., has been made secretary of the Motor Truck Committee.

Following the recent convention of motor car manufacturers, the question of further standardization of trucks was discussed. A committee has been appointed to consider the matter in co-operation with the Society of Automotive Engineers. The committee consists of: D. C. Fenner, chairman (Mack), Francis Davis (Pierce-Arrow), F. A. Whitten (General Motors), E. M. Sternberg (Sterling), F. F. Beall (Packard).

The feeling that it might be time to revise the Standard Service and Standard Repair Parts Policies as they relate to trucks, resulted in the appointment of a committee to take charge of this matter, as follows: E. T. Herbig, chairman (Service), F. H. Drew (Packard), W. M. Ladd (Pierce-Arrow), A. B. Cumner (Autocar), F. H. Harris (Republic).



Use an up-to-date N. C. R. System and match your neighbor's success!

The garage that combines a cash register system with progressive business methods is bound to grow.

The garage that handles money and accounts slowly by hand instead of quickly by machinery, cannot meet competition.

An up-to-date N. C. R. System protects hard-earned profits; increases trade; cuts down ex-

penses; makes clerks more efficient; stops errors, losses, and disputes; speeds up the business.

Every garage needs the help of an up-to-date N. C. R. System in handling money and accounts.

An N. C. R. System is within the reach of everybody. The payments are easy and the machine will more than pay for itself out of what it saves.

An N. C. R. System is a modern garage necessity

The National Cash Register Company
Dayton, Ohio
Offices in all the principal cities of the world

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

New Wholesale Policy Adopted by Times Square Supply House



President Jesse Froehlich has adopted a new wholesale policy for the Times Square Auto Supply Co., which he founded more than 14 years ago. This concern now operates twenty-one branches in eighteen leading cities in the United States. The new wholesale policy, as outlined by Mr. Froehlich permits any dealer or garage man to represent this house and sell Times Square Auto Supply Co. goods at the same prices as they are sold in the firm's own retail stores.

The dealer who buys from the Times Square Auto Supply Co. is supplied with

an attractive window sign showing he is a Timesco dealer, which identifies him as the local distributor of the Times Square line.

The dealer is also supplied with consumer's catalogues which list practically everything pertaining to an automobile. These catalogues bear the dealer's name and address and he distributes these catalogues as his own. The Times Square Auto Supply Company supplies the dealer at wholesale with anything mentioned in this catalogue; so he can sell to his customers at the retail prices quoted and make a fair profit for himself.

In order to help the dealer get the utmost benefit from this new wholesale policy, the Times Square concern is to give free the services of dealer's business building departments, viz.:

The Timesco Dealer Help Department, which furnishes dealers counsel on accounting, financial and legal matters.

The Timesco Window Trimming Department gives dealers practical suggestions on how to trim windows effectively so as to bring trade.

The Timesco Newspaper Ad Service



Times Square Headquarters.

furnishes dealers, at nominal charge, with attractive cuts and electros especially adapted for newspaper work and also prepares free any special advertising matter the dealer may desire to boost his business.

All features of the new wholesale policy are outlined in the new catalogue just published "The Timesco Dealer." This catalogue is a combined catalogue, trade journal and dealers reference book. Among other features it has a dealers' reference chart which gives the dealer full information in regard to the various makes of American cars, such as the size of headlight and tail light bulbs of each car, the size spark plug, the size piston ring, the size tires and rims, the size headlight lens and the size brakes lining.

"The Timesco Dealer" is free to any

automobile supply dealer, garageman or repairman, and can be obtained by addressing the Times Square Auto Supply Co., Broadway and 56th Street, New York City.

Comrie and Cleary, New Firm in Advertising Field

Comrie and Cleary is a new Chicago advertising firm that has just been incorporated in Illinois. The officers are: President, Frank M. Comrie; vice-president and treasurer, William J. Cleary; secretary, Joseph M. Roeser. The board of di-



Frank M. Comrie.

rectors includes the officers and Edward J. Phillips.

Mr. Comrie was connected with the Chicago office of the J. Walter Thompson Co. for 25 years, and for three years of that period was manager of the concern's Cleveland office. He has conducted advertising campaigns for Shaler vulcanizers, National spark plugs, Stopshocks shock absorbers, Peerless motor cars, Republic tires, Baker electric vehicles, Service trucks, Glide cars, Mullins steel boats, Double Fabric tires, Garford bicycle saddles, Sterling and Fowler bicycles.

Mr. Cleary was office manager for the Chicago branch of the J. Walter Thompson Co., having been with that concern more than 14 years. For the last two years he was space buyer for the Thielecke Advertising Co. Mr. Roeser was formerly advertising manager for the Triangle Motor Parts Co. and Ederheimer, Stein & Co.

Business is a good deal like a game of chess, or driving an automobile on a State Road—you've got to take into constant consideration what the other man is likely to do.



TIMESCO Dealer.

HERE is Service— — DRIVE IN



*That is the
message of a*

FEDERAL ELECTRIC SIGN

A Federal electric sign attracts the transient trade. It adds distinction, individuality and attractiveness to your garage. Day and night it draws trade like a magnet to your door.

Inexpensive

The Federal electric sign is made of porcelain enamel. Cannot wear out, rust or decay. Costs but a few cents a day to operate. Widens your zone of attraction—draws motorists in search of service, past less attractively advertised establishments — pays for itself many times over.

12 Months to Pay

The first payment brings you the sign, and during the remaining 11 months you have its energetic services increasing your business and helping you meet payments. Once paid for, there is no other expense save the very slight cost of cleaning. Let us give you full information.

**—Send This
Coupon
Today**

Federal Sign System (Electric)
Lake and Des Plaines Streets Chicago, Ill.

Branches in All Large Cities

Please send me full particulars of the Federal Electric Sign suitable for my business.

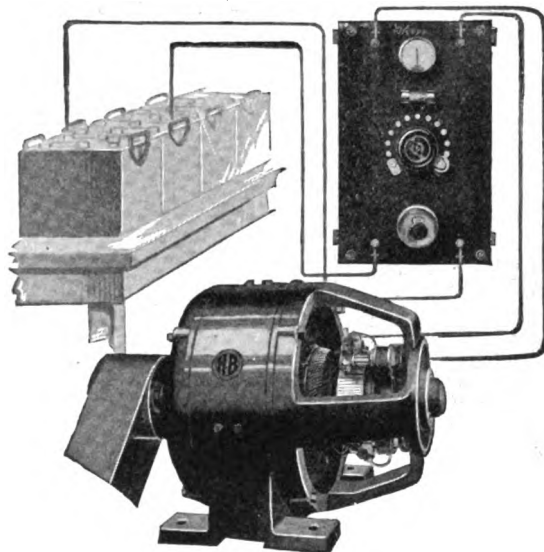
Frontage.....
Name.....
Address.....
No. of floors.....

(AGAD-4)

Accessories and Garage Equipment

HB LIGHTING AND BATTERY CHARGING SET

With the HB lighting and battery charging set, the garage operator that does not have electric current available from any public plant can make his own electric light and at the same time have the power necessary to handle the profitable business of recharging automobile storage batteries. The generator is a specially wound machine, 110 volts, direct current, speed 1800 r.p.m., weight 300 pounds. It operates from line shaft or engine, requiring 4 h.p. at full load. It supplies ample capacity for brilliant lights at low cost, and it will recharge at one time from 1 to 6 6-volt automobile storage batteries or their equivalent.



Since brilliant lights attract trade and improve service, and since battery charging is developing into such a profitable business, this outfit should be warmly received by the garage trade for which it is intended.

The HB lighting and battery charging set is furnished complete in every respect, ready to belt to engine and operate. It includes generator, base tracks, field rheostat, charging panel and pulley with 6-inch diameter and 4-inch face. No switchboard is necessary. Made and sold by Hobart Brothers Company, Troy, Ohio. Prices on application.

ECONOMY AND POWER CLAIMED FOR THREE-PIECE K. P. RINGS

Theo. Bohlmann, sales manager of the Keys Piston Ring Company, St. Louis, Mo., says that the economy and power given to engines by K. P. three-piece rings is what makes them favorites with garage men and

repair shop mechanics. He states that K. P. rings have also made good in other types of power machinery besides gasoline motors, these include steam engines, air and ammonia compressors, water and ammonia pumps. He says that they are especially good in all types of compressors as they keep back the oil and prevent it from going through into the air hose.

Mr. Bohlmann claims the following virtues for his concern's product:

K. P. Rings are made in three pieces; all the joints are blocked; joints are evenly distributed, which makes expansion equal to all parts of the cylinder; because all the joints are blocked, nothing can blow past the ring and there is absolutely no chance for carbon deposits on inside of ring; and, because of their equal expansion, they will take up the wear of an out-of-round cylinder, and there is no need of reboring if cylinders are not scored.

K-P Rings are made of a special processed gray iron that took years of development to perfect, which gives them elasticity and durability; K-P Rings are constructed with interlocking grooves, which hold the ring in place and eliminate all possibility of "play" or carbon pockets; K-P Rings will produce every bit of power a motor is supposed to have; and K-P Rings do not require an excessive amount of oil, hence do not use any more than the manufacturer's level.

EDUCATING FARMERS TO USE CORK INSERT

Advertisements illustrated by sectional views such as shown herewith are being used in farm papers to educate Ford owners to the use of Cork Insert transmission linings. Investigation proved that thousands of Ford owners barely know that their Fords had a transmission and had no idea of what actually took place when the brake or speed pedals were worked.

When the brake needs fixing, as the farmer terms it, he goes to the repair or garage man and leaves the car. When he gets it back he knows that some mysterious transformation has taken place and that the brake is much improved, but he does not know that the transmission lining has been renewed.



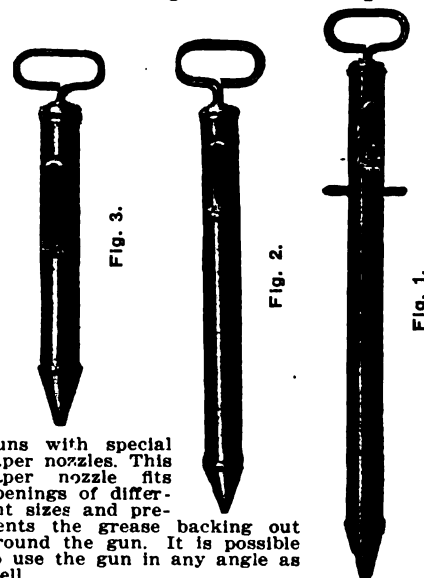
Hence this educational copy and illustrative matter which tells the Ford owner just the part the Cork Insert plays in making his Ford work smooth and making his brake safe.

CAR WASHING MADE EASY.

Automobile owners in general, and particularly operators of commercial garages and motor vehicle fleets, will be interested in the water spray auto brush now being marketed by the Scully Jones Company of Chicago. It is made of the best grade of bristles, circular in shape, and has a hose connection in the center through which water is sprayed.

HANEY CONCERN MAKES GREASE GUNS WITH TAPER NOZZLES

J. H. Haney & Co., of Hastings, Nebr., are now manufacturing a new line of grease



guns with special taper nozzles. This taper nozzle fits openings of different sizes and prevents the grease backing out around the gun. It is possible to use the gun in any angle as well.

No. 1, the shop and garage gun, is 24½ inches long x 1½ inches diameter. No. 2 is 19½ inches long x 1½ inches diameter and designed especially for tractor use. No. 3 is 12½ inches long x 1½ inches in diameter, designed especially for individual car owners' use. These guns are all steel throughout, having special valve, and are finished in baked enamel.

NEW TIP-TOP TIRE CAVITY RETREADING OUTFIT

The Akron Rubber Mold & Machine Co. has just brought out a new cavity retreading outfit, operating on the same principle as the regular cavity vulcanizer used for repairing casing punctures and blowouts. This machine, with self-contained steam boiler (Type E) can be purchased for much less than a retreading kettle and separate steam boiler, the use of large and expensive retreading kettle outfits being unnecessary since the development of the cavity retreading outfit.

The quality of work turned out with this outfit is said by the manufacturer to be fully equal if not better than work done by the kettle process, a number of the outfits having been in daily service by the big rubber companies for the last eight or nine months with the best of satisfaction both as to quality of results and convenience of operation.

With the Type E outfit one-third of the tread is vulcanized onto the old tire carcass at a time, the entire tread being accomplished in three operations. The elaborate and time-consuming system of wrapping the tire, required in the kettle process, is entirely dispensed with, the complete retread on an individual tire being accomplished as quickly with the cavity outfit as with the kettle.

The machine is made in one-third circle. Cavities fitted with ribbed tread, with provision for accomplishing plain tread by means of steel or special composition strips fitted into cavity. Made with either gas or gasoline fittings. Outfit includes steam gauge, water gauge, safety valve, two iron bars and eight clamps for holding tires in place, wrench, etc. Full particulars regarding this outfit can be obtained by addressing The Akron Rubber Mold & Machine Co., 947 Switzer avenue, Akron, Ohio.

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

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.....

Name

Address

JEWELL

BATTERY GAUGE

Your Battery Is Worth Protecting

The efficiency of your car is largely dependent upon your battery. When your battery dies, your car is stopped. With the JEWELL Battery Gauge mounted on your dash, you can tell at all times the exact conditions of your battery as easily as you can tell the speed of your car by glancing at the speedometer.



The JEWELL does not wait until the trouble has developed to disaster, but warns you before it really begins—in time to remedy it.

The most valuable and practical accessory ever put on a car.

See the dealer or write for details.

Manufactured by

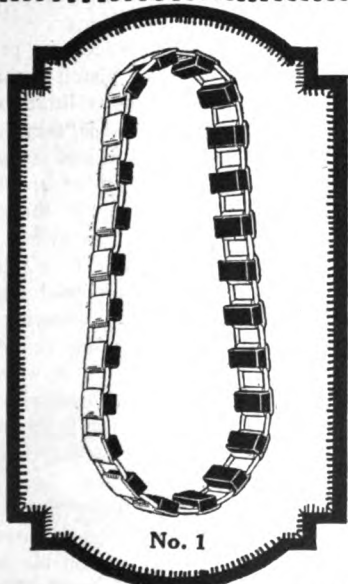
THE JEWELL ELECTRICAL INSTRUMENT COMPANY

1650 Walnut Street, CHICAGO, ILL.

Exclusive Sales Representatives

GRAY-HEATH COMPANY, 1440 S. Michigan Avenue, Chicago, Ill.

"CROWE" MECHANICAL FAN BELTS



No. 1

Best for automobiles, trucks, and tractors.

Unconditionally guaranteed to give satisfactory service.

Adjustable, Efficient, Silent, Strong. Steel and wire links insure strength, while sole leather blocks provide noiseless friction. These belts are not affected by heat, oil or water, and will not slip, stretch or break.

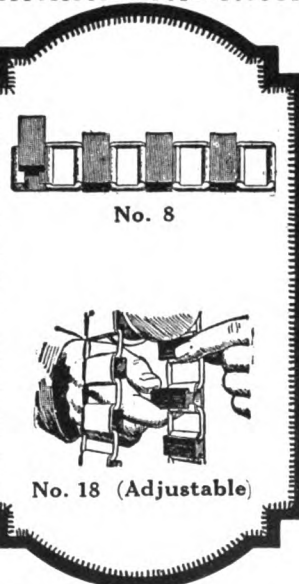
PRICES:

Standard Ford Sizes, adjustable to all models, each ... \$1.25
Flat Type, any length or width desired, per foot60
V Type, any length or width desired, per foot ... 1.20

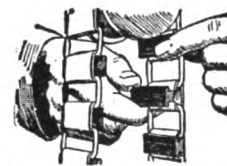
Attractive Dealer Proposition

"CROWE" MECHANICAL FAN BELTS are consistent sellers because they always give good service. Your profit is much greater than on ordinary fan belts.

Write today for details of our sales co-operation policy.



No. 8



No. 18 (Adjustable)

MECHANICAL BELT COMPANY

2014 Frederick Avenue

ST. JOSEPH, MISSOURI

Cylinder Grinding and Aluminite Pistons.

By C. R. Green, of Green Engineering Co., Dayton, O.

WHILE the importance of accurately ground cylinders has long been known to those experienced in the building of automobile motors, and to the well informed repair man it is just beginning to be realized by the average car owner.

In order that a motor may work properly and be correctly carbureted, the cylinders must be accurately ground so that the diameter does not vary more than .0005 inch as to roundness and the hole must be straight and absolutely square with the base of the cylinder, in order that the piston may be free to operate without being in a cramped position, thus inducing undue friction, noise and danger of scoring.

In building a high-grade motor, the method of machining is first to bore the cylinder from the rough casting to within .010" to .015" of the finished diameter and then to finish by grinding on one of the special cylinder grinding machines built for the purpose.

It is difficult and almost impossible to bore a cylinder from the rough casting so that the hole is square with the base, because of the tendency of the boring tool to follow the cored hole, and because the inaccuracy of the core invariably leaves the casting thicker on one side than on the other. The grinding wheel will straighten the hole and leave it square with the base, provided the grinding machine is of proper construction and rigid enough to handle the work.

Experience in building automobile motors in quantity has taught the writer that the operator of a cylinder grinder on production work, especially under the piece work system, is prone to tilt the cylinder in a direction to enable the grinding wheel to follow the crooked bored hole in order to shorten the time required for grinding and thus increase production, which practice is to be condemned.

Many of the lower priced motors are built without the final operation of grinding the cylinders, reaming or lapping to make a finished hole, being substituted for the grinding. This operation leaves a smooth hole which may measure round but which is usually not square with the base of the cylinder, and the relative efficiency of the motors thus produced depends largely on chance, as the cylinders may or may not be straight. This explains why cars of the same make and model are not parallel in performance.

Without an accurate straight cylinder, it is impossible to obtain good compression in a motor because it is impossible to fit a ring to an unround cylinder or to one which has been enlarged in the top either by wear or by inaccurate machining. Not alone is the compression ef-

fected but the leakage past the rings is more noticeable on the suction stroke when a certain amount of air is sucked up from the crankcase past the rings and into the combustion chamber weakening the mixture and causing the motor to miss, especially at idling speeds.

The first impulse of the driver when this condition occurs is to enrich the mixture, which overcomes in a measure, the difficulty but leads to more serious trouble. An excess of raw gasoline is thus introduced into the cylinder and works down past the rings on the compression stroke, thinning the oil and destroying its lubricating qualities and possibly resulting in one or more scored cylinders. This gasoline eventually reaches the crankcase and mixes with the oil, thinning it to such an extent that it is useless for lubricating. This condition is not only found in motors whose cylinders are worn from use, but is often present in comparatively new motors in which the cylinders have been inaccurately bored or reamed.

The popular relief for this condition, once the car owner becomes aware that it exists, is to install a set of new piston rings, which usually aggravates the condition because new rings require a long time to wear to a fit in an egg shaped cylinder, and the only real cure is to send the cylinders to some reliable company which is equipped with accurate special cylinder grinding machinery, and have the cylinders ground square with the base and fitted with new pistons and properly fitting rings. Care should be taken that the cylinders are not ground on a makeshift grinder, but on a machine built for the purpose by manufacturers of long experience in building this class of machinery.

Reground cylinders quite naturally require new pistons and rings. For commercial cars, iron pistons are usually provided on account of the comparatively low cost, but in passenger car motors where smoothness and flexibility are desired, aluminite pistons are desirable, provided, of course, that they are properly designed and fitted with the proper clearance. In an alloy piston, it is quite essential to provide a greater thickness of metal at the center of the head to prevent overheating at this point, and also to provide ribs or heat conduction members to carry the heat away from the head and distribute it to the cylinder walls through the body of the piston, where it is eventually carried away by the cooling water. Proper provision must also be made for lubrication, and a ring provided below the wrist pin to prevent too much oil from passing the piston.

The most serious mistake has been made in fitting alloy pistons with too little clearance on account of the fear of the so called "piston slap," which is usually traceable to a loose wrist pin or a loose connecting rod bearing, and the writer has even known of noises caused by camshaft bearings coming loose and being struck by

the cam being mistaken for piston slap in a motor equipped with iron pistons having only .002" clearance. Often a piston which is fit too tightly will swell until it binds the cylinder walls and make a decided knock when the motor is pulled on a hill. Conditions of this kind have often been mistaken for "piston slap" caused from a loose piston.

A properly designed alloy piston will not slap in a cold motor with a clearance of .003" per inch of diameter, and while this amount of clearance is rarely necessary, except in racing motors, we have experimented with pistons having much greater clearance, with no ill effect, while a piston with too little clearance will increase the friction enormously and absorb a large part of the power of the motor. This is true of both iron and aluminum.

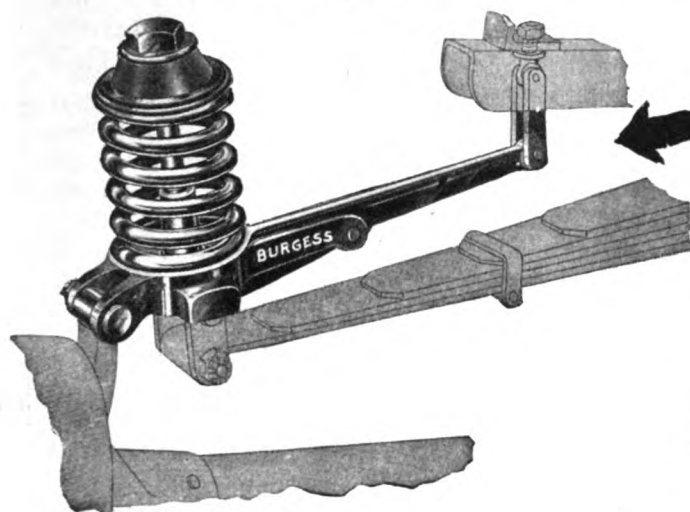
The point is usually overlooked, that while an iron piston having excess clearance may be noisy, yet an aluminum piston is so light that it is difficult for it to strike the cylinder wall with sufficient weight to produce a disagreeable noise and the sound would be entirely different from that of an iron piston. We have equipped Hudson Super Six motors with aluminite pistons having a clearance of .010" which could be pulled down to five miles per hour on the steepest hills with no sound of any kind in the motor.

We have found it advisable on aluminite pistons of the larger diameters, from four inches up, in order to obtain the proper stiffness to enable the piston to hold its shape under all conditions and not distort under hard service, to employ the hour glass construction in the design, the straight side piston being used to advantage in the smaller diameters. Thus by correct and careful designing the piston is free from distortion and will not spring under heavy loads.

The difficulty experienced in producing an extremely light iron piston is that when the metal is thinned to its limit to reduce the weight, the stiffness is sacrificed and the piston has not sufficient strength to prevent its springing out of shape under heavy loads and binding in the cylinder. The metal being thin also allows an excessive overheating, as it is obvious that if the metal in the piston head was something under 1/32" thick, allowing that it would be sufficiently strong to withstand the force of the explosion, it would melt. It follows then that with a piston head 3/32" thick the center will attain a red heat in a high speed motor. This I have demonstrated by experiment.

The lightness of aluminite allows sufficient thickness of metal to be used in the head to keep it at a reasonable temperature and a properly designed piston will not become hot enough to cause the carbon to form on the inside. Examination of any iron piston removed from a motor will show the carbon burned on the under side of the piston head.

Pull Down on This Arm Checks Rebound With All the Effect of a Snubber



When the leaf spring attempts to rebound, it pulls on the arm attached to the body so that it is virtually pulling against itself.

In this manner the last vestige of recoil is eliminated.

Other Features of BURGESS Supremacy

BURGESS "Triple Duty" Rebound Check and Shock Absorbers ride the car and passengers directly on four coil springs which are so mounted that no guides or other retarding mechanism is required.

These big springs with BURGESS Rubber Cap will absorb ninety periodic vibrations per second, more than three times as many as any other type of auxiliary spring will absorb.

Smoother, quieter, easier riding with a BURGESS equipped car.

Write for descriptive circular.

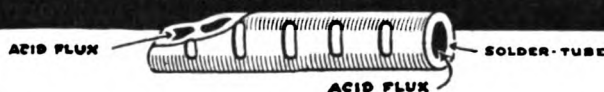
BURGESS

"TRIPLE" PATENTED "DUTY"
REBOUND CHECK AND SHOCK ABSORBER

Manufactured and
Guaranteed by
WALTER S. BURGESS
Mfg. Co.

Sales Department
THE ZINKE COMPANY
1323 S. Michigan Ave.,
Chicago, Ill.

COMPARE THE COSTS AND YOU WILL APPRECIATE "THE BIG ECONOMY"



Tests conducted under actual working conditions have demonstrated the economy of Kester Acid-Core Wire Solder in dollars and cents. On automobile work it has proved a big saver of time, labor and material. With other solder much time is wasted hunting, preparing or applying the acid soldering flux.

Sold in 1 pound coils in cartons, also on 1, 5 and 10 pound spools.

Send for a free sample, giving your jobber's name.

CHICAGO SOLDER COMPANY
CHICAGO-U.S.A.

KESTER

ACID-CORE



WIRE SOLDER



Have you a "Piston Ring Primer" in your pocket? It has 16 pages of valuable information. Free to you.

Zelnicker EVER-TYTES dont need any hot air to help em—they just naterally sell themselves to the boys who use em.

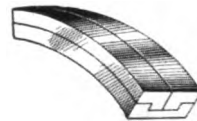
MANUFACTURED BY

The Ever Tight Piston Ring Company

3124 LOCUST STREET

AG&AD 3-19

ST. LOUIS, MO.



RIGHT ANGLE INTERLOCK

Ever-Tyte Bill *Says:-*

A lot of fellers in this here bizness world make the mistake of eather talkin to much or writin to much—in plane English, shootin the bull. Now I'm considerable of a wind-jammer myself, but I reelize that its a good idear to be able to back up what I sez or does—anyhow I tries to keep from makin claims that would make me a canderdate for a foolish house.

The Boss in our shop sez—"Bill, dont fergit that ole sayin about the—proof of the pudden—and when yer inklined to get highsterikel readin the adds of some of these here pistin ring fellers, release yer clutch and put yer foot on yer brake peddle eazy or yer lieble to skid"—So sez I—Bill go eazy—cut out the bunk—stick to facks—cauz yer cant even get away with that stuff with poor eazy marks like fellers who repare buzz wagons ten or twelve hours a days and who of coarse dont no nuthin about pistin rings.

Speakin of facks—these **Zelnicker EVER-TYTES** are doin things in ottermobiles, gaserline engines, kompressers and even steam engines that no pistin ring made has ever dun.

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

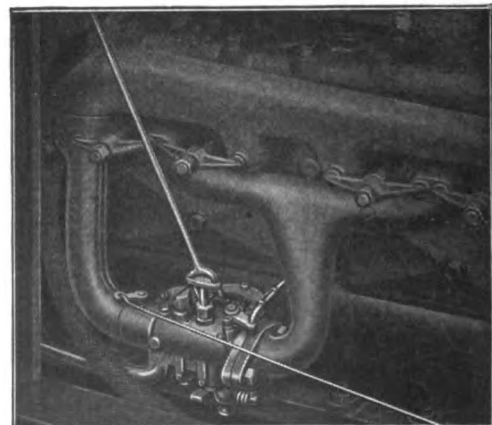
Price F. O. B. Factory \$10.00

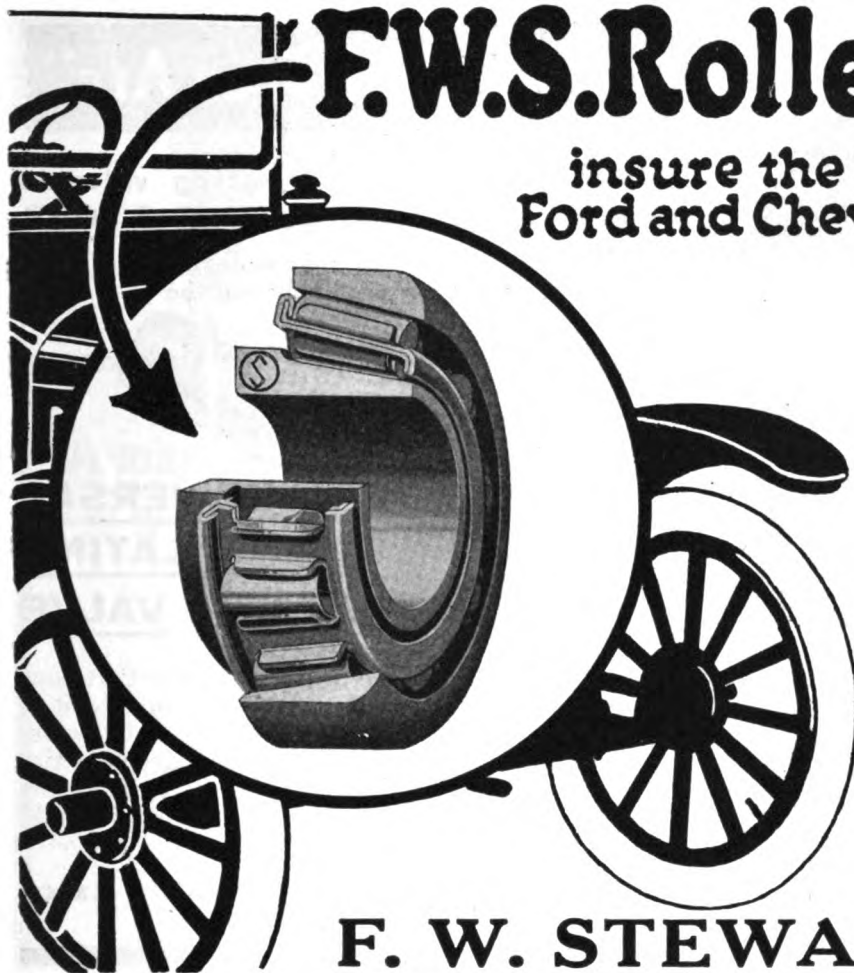
MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all ¾-ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Overland and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.





F.W.S. Roller Bearings

insure the best service for
Ford and Chevrolet Front Wheels

Breakage Prevented—Friction and wear are practically eliminated by the large rollers.

Longer Life—Cones and rings are made of **especially prepared steel properly tempered** and ground to absolute accuracy in size and contour. Rollers are held in correct position by two-ply high carbon pressed steel with reinforced outer edge.

Utmost Efficiency—Equal bearing surface; thorough lubrication; no dirt accumulation; and perfect alignment are features of its efficient design.

"The Bearing Your Trade Wants"

F. W. STEWART 1402 Michigan Ave.
Chicago, Ill.

 An illustration of a man in a hat and overalls using a long-handled pump to inflate a tire. The pump is mounted on a wooden structure. A banner at the bottom of the illustration reads "MFG & GUARANTEED BY J.H. HANEY & CO HASTINGS NEB."

ROSE TIRE PUMPS

outsell other pumps on the market today.

Correct design, quality, material, and workmanship make the

ROSE

superior to all other pumps.

- Seamless steel barrel will not dent.
- Solid steel top and base will not break.
- Patent valve admits more air to the barrel.
- Cupped leather tanned under a secret process.

THE ROSE IS A FIVE YEAR PUMP

| | |
|----------------------------------|--------|
| Rose Tire Pump 1 1/4" barrel.... | \$3.00 |
| Rose Tire Pump 1 1/2" barrel.... | 3.50 |

Handled by most jobbers and dealers.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

NOKORODE

will solder any difficult job which comes to the Garage

Many troublesome little jobs, yet profitable jobs, can be mended with NOKORODE.

Ideal for soldering radiators, gasoline tanks, feed pipes, waterproofing hoods, etc., etc. Every day finds new uses for NOKORODE.

Insures perfect soldering. For new work or repair jobs. Write for descriptive literature, prices and sample.

THE M. W. DUNTON CO.
PROVIDENCE, R. I., U. S. A.

\$1.00 FOR A SOLDERING SUGGESTION

If you can do anything with the soldering iron, no matter what it is, write us, giving as good a description as possible. If the suggestion is one that we can publish, we will send you \$1.00 in cash.



GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company
1002 Washington Boulevard
Chicago, Illinois

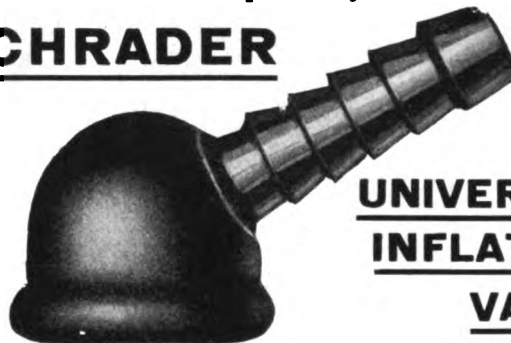


No wasted "Free Air"

SNAP! When the inflating valve is removed the **AIR PRESSURE STOPS**

All garages and repair shops distributing free air can profitably use the

SCHRADER



**UNIVERSAL
INFLATING
VALVE**

If you have a SCHRADER valve you know that your "bottled air" is safely tucked away the minute it is taken off the tire valve. The air is released by pressing the nozzle of the inflating valve against the tire valve, and stopped by removing the device from the tire valve. Fits any diameter of hose from $\frac{1}{4}$ to $\frac{5}{8}$ inch. **Price, \$1.50.**

A. SCHRADER'S SON, Inc.
783-793 Atlantic Ave., Brooklyn, N. Y.

AMPECO PRODUCTS

Sell readily because their superiority is well known to the Motoring Public

AMPECO PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. AMPECO Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes. We also make the famous AMPECO WHEEL PULLERS and BRAKE SHOES, both one- and two-piece.

If your jobber does not handle AMPECO Products, write us direct.

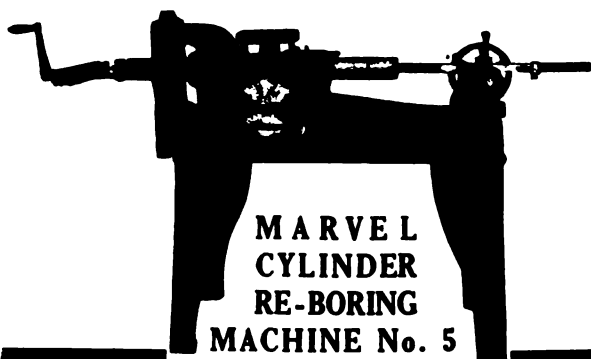
F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

General Selling Agent for

**American
Machine
Products
Co.**

Marshalltown,
Iowa





**MARVEL
CYLINDER
RE-BORING
MACHINE No. 5**

A machine that hands you a check each week

It is the biggest business builder and profit maker that ever went into a garage or machine shop.

It will pay you a handsome dividend.

It will bring other work to your shop as well as establish you as headquarters for prompt—careful—satisfactory

CYLINDER RE-BORING

The MARVEL handles any gas engine cylinder from a motorcycle to a tractor.

It is simple to operate—automatic—accurate and efficient.

It is rugged in construction, and being power driven permits the operator to attend to other work while re-boring.

Every day you are without a MARVEL No. 5 in your shop, you are paying for it in lost profits and dividends. Investigate today.

Equip yourself to re-bore the engine cylinders and fit them with MARCO OVERSIZE PISTONS.

Ask us for descriptive matter and our co-operative advertising helps—Act today—tomorrow never comes.

MARVEL MACHINERY CO.

1307 S. Third Street, Minneapolis, Minn.

In writing use address in full—it expedites delivery.

DEALERS!

Send for our new wholesale catalogue—"THE TIMESCO DEALER." This is a combined Catalogue, Trade Journal and Dealer's Reference Book—for Dealers and Garagemen only. It tells you how to sell more auto supplies at a bigger profit. It represents the result of 14 years experience in retailing auto supplies; all of which is now placed free, at the service of any auto supply dealer or garageman. It lists everything and anything pertaining to automobiles at lowest net wholesale prices. It is a Book that every auto supply dealer and garageman should have.

SEND FOR IT TODAY, FOR IT WILL SHOW YOU HOW TO MAKE MORE MONEY.

Sent free to any Dealer or Garageman.

TIMES SQUARE AUTO SUPPLY CO.

Dept. S MAIN OFFICE
NEW YORK, N. Y.—B'WAY & 56th ST.

Distributing Branches in the following cities:

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| Boston, | Mass. | Memphis, | Tenn. |
| Chicago, | Ill. | New York, | N. Y. |
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This handsome Wholesale Catalog and Dealers' Reference Book sent Free to any legitimate auto supply dealer, garage, or repairman.



**It's a happy
garageman
who has a
HOLMES
WRECKING
TRUCK**

This advertisement actually expresses the attitude of hundreds of garagemen and repairmen who have a **HOLMES WRECKING TRUCK**.

Regardless of the wrecked condition of the car, it can be readily "towed in" with a **HOLMES**.

Staunchly built, frame and wheels of malleable iron castings, Hyatt roller bearings for wheels and tongue of second growth ash.

PRICE, \$50.00

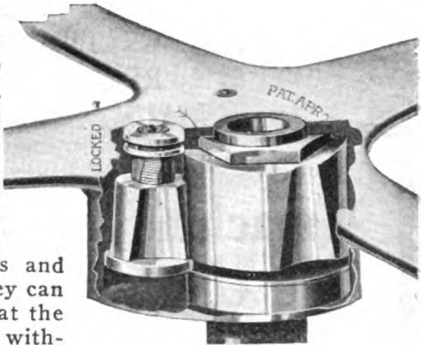
Special Discounts to Garages and Dealers.

ROBERT HOLMES & BROS.
DANVILLE, ILLINOIS

"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."



*Approved by the Underwriters' Laboratories,
and affords 15% discount on insurance.*

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

Write today for particulars.

THE RELIANCE COMPANY

411-417 So. Sangamon St.,

CHICAGO, ILL.

Distributors in every state

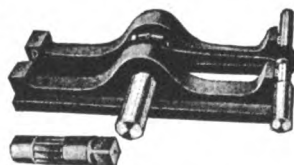
May we show how
profits can be
increased.

STORM

CYLINDER RE-
BORING MACHINES



Storm Cylinder
Reboring Machine



The Storm Connecting Rod Bearing
Reamer, Jig and Straightening Gauge

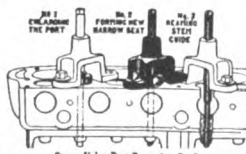
Of course you are interested in getting the maximum profits out of your repair business. You owe it to yourself to investigate a line of equipment that is saving time, labor and money in hundreds of repair shops. Our line includes the

STORM Cylinder Reboring Machines
STORM Piston Vise
STORM Valve Port Renewing Outfit
STORM Connecting Rod Bearing Reamer, Jig and Straightening Gauge

Write today for catalogue
giving us your jobber's name

STORM MFG CO.

1714 4th St. THOMPSON, IOWA



Storm Valve Port Renewing Outfit

Pondelick Brothers

will pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrinding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

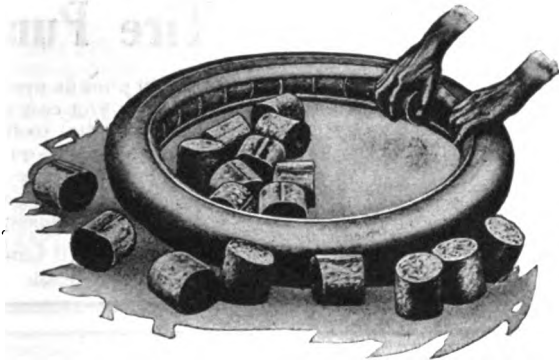
How You Can Conserve with National Rubber Tire Filler

More Miles Per Tire—Less Tires to Buy and No Buying of Tubes at All.

During the period of the War we learned to conserve in many ways—Food, Fuel, Farm-stuffs, Man-power and Transportation Facilities were first. The use of

National Rubber Tire Filler

offers you a medium for continuing to conserve without any sacrifice whatever.



Motorists Have No Tire Trouble Who Ride on This Perfect Substitute for Air

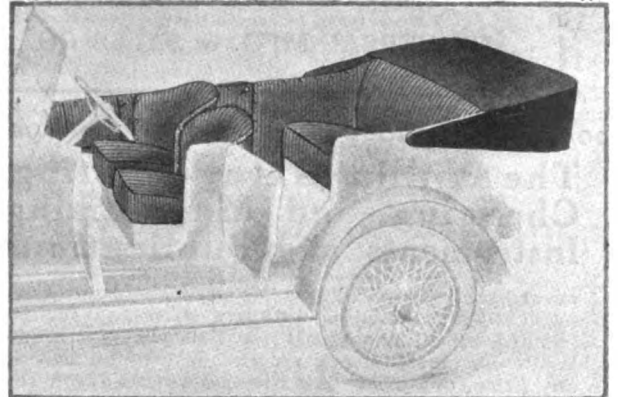
Rim-cut-proof, blowout-proof, puncture-proof tires are now a reality. Motoring is now freed from the shackles of tire trouble, and is made safe, comfortable and enjoyable.

National Rubber Tire Filler replaces the inner tube. It has all the resiliency of an air-filled tire with none of its disadvantages. It lasts indefinitely—40,000 miles or more. It has been in use for seven years and has conclusively proven its superiority and economy over air-filled tires. Our factory taxed to capacity is proof positive of its great popularity.

**It rides as easy as air.
It cannot puncture or blowout.
It can be used on all style tires.
It doubles tire mileage.
It is easily installed.
It stimulates motoring.**

National Rubber Filler Company
210 College Street Midlothian, Texas

Badger



Seat Covers Slip Roofs—Back Curtains Tire Covers

No motorist can afford to buy **Seat Covers, Slip Roofs, Tire Covers or Back Curtains** before he sees the BADGER line.

No dealer should **think** of stocking any other before he sees the splendid advantages BADGER has to offer.

The BADGER line comprises a far more comprehensive selection of fabrics. It possesses many advanced improvements. It is representative of the highest degree of quality and wear value. It offers many superiorities — **needed** betterments that guarantee a splendid sales increase for any dealer.

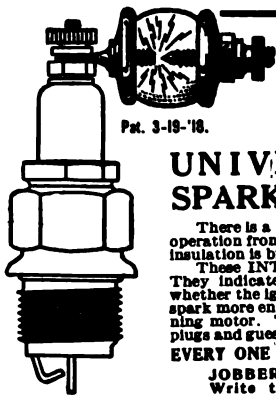
Prices as low and in many cases lower than asked for inferior makes.

Our catalog illustrates and describes the season's most attractive offerings. Comparison of quality **and** prices is **certain** to win the motorist's preference for BADGER every time.

DEALERS—This catalog is yours for the asking. You should have it. You need it—and **need it now**—if you want the line of least resistance.

Most meritorious—and because it **is**—the greatest money-maker for the dealer. Write today.

Wisconsin Auto Top Co.
2 Main Street - - Racine, Wis.



Pat. 3-19-'18.

Spark Plug Troubles Are Rare Occurrences

on the car equipped with

UNIVERSAL or MARVEL SPARK PLUG INTENSIFIERS

There is a big demand for a device that insures satisfactory operation from spark plugs which are worn out or on which the insulation is broken; or a plug fouled with grease or carbon.

These INTENSIFIERS will make such plugs fire perfectly. They indicate instantly whether a cylinder is missing and whether the ignition system is in perfect order. They give the spark more energy—producing more power and a smooth running motor. They eliminate carbon, waste of gas, cleaning the plugs and guessing which cylinder is missing.

EVERY ONE OF YOUR CUSTOMERS WILL WANT THEM

JOBBERs and DEALERs—Your profit is liberal.
Write today for our attractive proposition.

UNIVERSAL MFG. & SALES CO.

550 W. Harrison Street

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The Phillips Garage Testing, Charging and Magnetizing Instruments and Publications

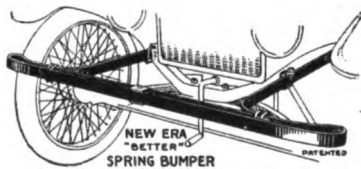
covering all electrical systems used on Motor Cars back to and including 1910 are used and recommended by all leading Motor Car Manufacturers. While our instruments are the best to be had at any price, our prices are the lowest of any on the market.

We want 200 more salesmen, who can earn from \$100 to \$500 per week selling these products. Experience not necessary. Write today for full particulars.

PHILLIPS ENGINEERING CO.

Dept. E

DAYTON, OHIO



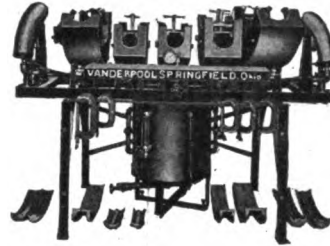
Double front bar full length, 1 3/4 x 5/16" spring steel, has great resisting power, is light, strong and neat, guaranteed against damage or defective parts. Made to fit all cars. For sale by first class dealers everywhere.

THE NEW ERA SPRING & SPECIALTY CO.

1152 Hamilton Avenue, Grands Rapids, Michigan

A CHANCE OF 10 LIFETIMES

OPEN A TIRE REPAIRING SHOP AT ONCE.
The greatest money-making business on earth requiring such small capital.



**VANDERPOOL
VULCANIZER**

5 Cavity Model does everything—can turn out \$100 worth of work every day. No experience necessary. Write for **FREE TIRE REPAIRING MANUAL**—explains entire workings of the business.

In answering address
Dept. G8.

WM. VANDERPOOL CO. : Springfield, Ohio

Tell your customers
not to break their
backs pumping tires.

\$5.50

Jensen Tire Pump



Will produce 90 pounds pressure more easily than you can pump 65 pounds with the ordinary vertical pump, with one-quarter the effort and in half the time. Well made throughout.

Discounts on request

The W. H. Howell Company
Geneva, Illinois

AUTOMOTIVE "EQUIPMENTLY" SPEAKING

OUR LOCATION HAS ENABLED US TO BECOME

QUICK SHIPPERS

IN EQUIPMENT, REPAIR MACHINERY AND ACCESSORIES
FOR THE "BIG FIVE"

Motor Car--Motor Truck--Tractor--Motor Boat--Aeroplane

WE ARE TERRITORIAL DISTRIBUTORS FOR

Service Station Equipment Co. Inc., of Chicago, Ill.

"AMBU" Battery Station Appliances

Firestone Demountable Rims.

ESTABLISHED 67 YEARS

BECK & CORBITT

AUTOMOTIVE EQUIPMENT

1222 to 1244 North Main Street

ST. LOUIS, U. S. A.

KENNEDY

Auto Storage Covers

furnish efficient protection for cars in dead storage. They are made of strong, heavy paper, properly reinforced, and in standard sizes to fit any car.

Made only by

THE KENNEDY CAR LINER & BAG CO., Shelbyville, Ind.

GUARANTEED SPRINGS

CARRIED IN STOCK FOR
ALL MAKES OF CARS

For QUICK and SATISFACTORY SERVICE
order your springs from

Write for our catalog TO-DAY—DONT DELAY
Liberal Discounts to Dealers



"Style C"

**AUTO SPRING
REPAIR CO.**

1331 W. Jackson Blvd.
CHICAGO, ILL.

BERMO

\$25 to \$300

To do welding economically and profitably, you must have the proper equipment. **BERMO WELDING PLANTS** are made in a number of styles, embracing every purpose. Every garage and repair shop should have one.

Write for particulars and our time payment plan.

A. J. BERMO CO.
OMAHA, NEB.

3 to 6 months
to pay

WELDING PLANTS



Battleships like this ride the water easily.

because their great weight gives them ample stability. We have likewise solved the problem of giving the Ford the stability and smooth running qualities possessed by heavier cars.

W&C SHOCK ABSORBERS are also built for service and comfort

Over 200,000 sets are in use and the demand is growing. Your profit is liberal. Write today for our trade proposition.

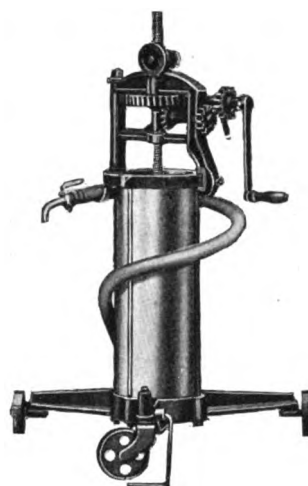
P.H. Webber Co.
Hoopeston
Ill.



REVOLVING CABINETS

Just what you want for carrying your supplies. Thousands of these Cabinets are in use by dealers in automobile sundries, garages, etc. Made in various styles and sizes. Catalog on application. Sold by leading jobbers.

American Bolt & Screw Case Co.
DAYTON, OHIO



Ekern Portable Garage Grease Gun, Model N.

Business thrives when they're around

People invariably patronize garages which give honest service. If you have either an

EKERN MODEL N or MODEL K PORTABLE GARAGE GREASE GUN, your sales of grease or oil will be publicly registered.

Portable, practical and clean guns.

The EKERN is the only hand operated gun on the market that will work any weight of grease as well as oil.

Model K holds 20 lbs. grease or 2½ gals. oil.
Model N holds 56 lbs. grease or 7 gals. oil.

So that you may become better acquainted with the "money-making" advantages of PARO specialties send for copy of our new booklet.

Your regular jobber can fill your order.



1412-14 South Michigan Boulevard, Chicago, Ill.

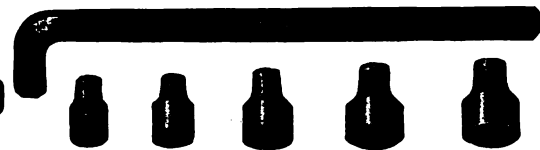
"CURKO" SOCKET WRENCHES

Are turned from the best Solid Bar Steel and are Heat Treated. For

STRENGTH and RELIABILITY

They are unexcelled. Ask for dealer's discount.

Price
\$1.50



Graham Roller Bearing Co., Coudersport, Pa.

Put your repair charges on a profitable basis with



BAIRD TIMING DEVICES

Keep a check on your employees' time and learn exactly what each job costs. Automatic supervision turns losses into profits.

Prices moderate. Write today for booklet.

Baird Equipment Co.
324 W. Ohio St., Chicago
Phone Superior 2071



Tire Applying Press

Hydraulic Arbor Presses

work easier than any others.

We make many sizes for many purposes.



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Lourie Manufacturing Co.
SPRINGFIELD, ILL.

The Garage *and* Shop Market Place

SAVE ON ALL AUTO PARTS

The greatest stock in the Middle West. All parts of all standard makes. Quickest service. Great volume makes it possible to sell to you for—

50 to 75% Less

than NEW PARTS would cost. Only the best parts sold and backed by an iron-clad guarantee.

Our Guarantee: Absolute satisfaction or money cheerfully refunded. For instant service on parts, write, phone or wire—

Auto Wrecking Co.

"We Tear 'Em Up and Sell the Pieces"

13th and Oak Kansas City, Mo.

Cylinder Regrinding Pistons Rings Pins

WORK, MATERIAL and
ENGINEERING are RIGHT

BUTLER MFG. CO.

1120 E. Georgia Street
INDIANAPOLIS

LOWEST PRICES on Good Serviceable PARTS

for all cars.

We are the biggest wreckers in the world. The size of our business enables us to undersell all competition.

Money cheerfully refunded if you are not satisfied.

We make a specialty of our service to the trade and can supply you with practically any parts you want from stock. Orders shipped the day received. Our stock includes motors, Bosch magnets, coils, magneto parts, rear axles complete with wheels, differentials, tires, rims, and all other parts.

Correspondence from the trade invited.

WARSHAWSKY & CO.

Largest Car Wreckers in the World
1915 So. State St. CHICAGO, ILL.

STANDARD AUTO SALVAGE CO.

Successors to

MAXWELL BROS. AUTOMOBILE PARTS and SUPPLIES

Attractive Prices
Prompt Service
Satisfaction Guaranteed
TRY US

3931-33 Olive Street, ST. LOUIS, MO.

CYLINDERS REGROUND

We have the best equipped shop in the Northwest. Our expert mechanics and highest grade equipment are your guarantee of a superior job. Over 800 Piston Patterns in stock.

GEAR CUTTING

Spur, internal, bevel, etc.

WE ALSO *"The Capitol"* MARINE
BUILD MOTOR

Special prices to the trade
Write us today

AUTO ENGINE WORKS

ST. PAUL, MINN.

SOLDIERS and SAILORS

Your Best Opportunity

for a new start is in the automobile business. Wages are good and opportunities unlimited. The Greer College will make you expert in any branch of the automobile field. Tuition reasonable.

Write today for free booklet.

GREER COLLEGE

1519 So. Wabash Ave., Chicago, Ill.

Write

AUTO PARTS CO.

For

REPAIR PARTS

Our new Bulletin of used parts and prices now ready.

With this Bulletin in your shop, you can supply repair parts for all makes and models of cars listed and increase your repair business.

It is free. Write for it today.

AUTO PARTS CO.

4105 Olive Street, St. Louis, Mo.

CYLINDERS

Ground by
SUNDERLAND'S
give satisfaction

Magnalite or Cast Iron PISTONS

Special Prices on Ford Jobs
Regrinding — New Pistons

Write for quotations

SUNDERLAND MACHINERY CO.

1006-8-10 Douglas Omaha, Neb.

SCORED CYLINDERS

Repaired by Patented Process. Fused with our silver-nickel alloy. (Eliminates Grinding.) No warping. Same pistons fit. Reshipped 24 hours after received.

L. LAWRENCE & CO.

PLANTS AT
Chicago—1822 Michigan Avenue
Detroit—1246 E. Jefferson Avenue
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ANDRE CATELAIN

Everready Automatic Engine Starter. General machine work for foreign and American cars. Welding of all metals. Manufacturer Catelain Hose Coupling.

1446-S Indiana Ave. Chicago, Ill.

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page will render you
prompt, efficient service

RADIATORS

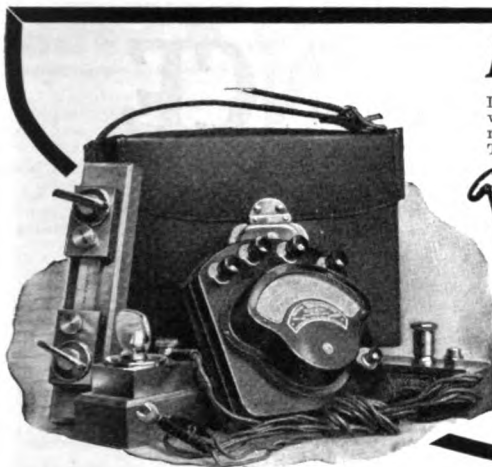
MADE AND REPAIRED

Ship your Radiator to us today
and get it back in 24 hours.

Written guarantee with every job.

Detroit Auto Radiator Co.

180 Fifth Street Milwaukee, Wis.



Big Money in Electrical Repairs

If you cannot repair electric starting and lighting equipment intelligently, your customer will go elsewhere for this service. He will take the rest of his trade with him. There is more money in electrical repairs than in any other department of the garage business. The demand is enormously increasing.

Weston

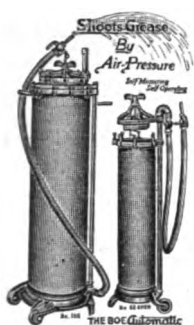
Model 280
GARAGE TESTING INSTRUMENT

is the best, the most reliable and therefore the cheapest electrical equipment for you. It enables you to determine promptly and accurately the condition of the electrical equipment of any automobile, just where the trouble is and just how to remedy it. We are returning to normal conditions as rapidly as possible, but we necessarily must complete government work in hand before full normal service can be rendered.

Weston Electrical Instrument Co., 30 Weston Ave., Newark, N. J.

Branch Offices in the Larger Cities

The AUTOMATIC and the REPEATER GREASE and OIL GUN



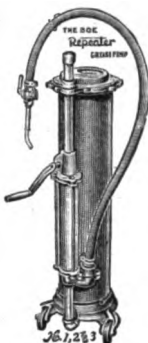
Improved self measuring meter—absolutely accurate. Can furnish either in Air Pressure, or Crank Operated

Used by U. S. and by nearly all Motor Car Manufacturers and by thousands of Garagemen. Capacity 25 lbs., 50 lbs. and 100 lbs.

Saves Time Saves Lubricant

Sold by over three hundred jobbers and wholesalers. Write to us about it.

H. M. BOE MFG. CO.
Minneapolis, Minn.



Abide by the President's Message and Conserve Your Nation's Resources



Bale Your Waste Paper—Don't Burn It—Baled Paper is worth real money. Keeps your place clean, sanitary, and the Safety-First All Steel Balers are Fire-proof. Prices from \$32.50 up. Write for circulars.

CHICAGO BALING PRESS COMPANY
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A Page of Opportunities

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WAGNER AUTO ENGINE CLEANER

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The M. W. Duntun Co., Providence, R. I. (Radiator Care).
Gray-Heath Co., Chicago.
New Era Spring and Specialty Co., Grand Rapids, Mich.
Times Square Auto Supply Co., Broadway at 56th St., New York City.

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General Utility Co., 1338 Ogden St., Philadelphia, Pa.
Globe Mfg. Co., Battle Creek, Mich.
U. S. Air Compressor Co., 6542 Carnegie Ave., Cleveland, O.

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Elgin Motor Car Corporation, Chicago.

AUTOMOBILE TRAILERS

Miami Trailer Co., Troy, Miami Co., Ohio.

AUTOMOBILE WHEELS

National Wire Wheel Works, Geneva, N. Y.

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Defender Auto Lock Co., Marquette Bldg., Detroit, Mich.
Reliance Co., 428 W. 38th St., Chicago.

AUTO TOPS

Wisconsin Auto Top Co., 2 Main St., Racine, Wis.

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Andrew Hoffman Mfg. Co., 5032 So. State St., Chicago.

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H. G. Paro Co., 1410 S. Michigan Ave., Chicago.

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Chicago Baling Press Co., 205 S. La Salle St., Chicago, Ill.

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Graham Roller Bearing Co., Coudersport, Pa.
The Norma Company of America, 1790 Broadway, New York City.
F. W. Stewart, 1402 Michigan Ave., Chicago.

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Universal Battery Co., 3414 So. La Salle St., Chicago.

BATTERY CHARGERS

Hobart Bros. Co., Troy, Ohio.

BATTERY GAUGES

Jewell Electrical Instrument Co., 1650 Walnut St., Chicago.

BODY POLISHES

Waxit Mfg. Co., 1539 Old Colony Bldg., Chicago.

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American Technical Society, Chicago.
Phillips Engineering Co., Dayton, Ohio.

BUMPERS

New Era Spring & Specialty Co., 1152 Hamilton Ave., Grand Rapids, Mich.

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American Bolt & Screw Case Co., Dayton, Ohio.
Hobart Bros. Co., Troy, Ohio.

CARBON REMOVERS

E. A. Cassidy Co., 285 Madison Ave., New York City. (Sales Dept. for Eccolene Co., Detroit, Mich.)

CARBURETORS

Marvel Carburetor Co., Flint, Mich.

CASH REGISTERS

National Cash Register Co., Dayton, O.

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States Chemical Co., 680 W. Austin Ave., Chicago.

COVERS

Kennedy Car Liner & Bag Co., Shelbyville, Ind.

CREEPERS (For Repair Shops)

Foster Bros. Mfg. Co., Utica, N. Y.

CUT-OUTS (Muffler)

Edward A. Cassidy Co., Inc., Madison Ave. at 40th St., New York City.

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Hinckley Machine Works, Hinckley, Ill.
Marvel Machinery Co., Minneapolis, Minn.
Storm Mfg. Co., Thompson, Iowa.

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Marmon Chicago Co., 2430 S. Michigan Ave., Chicago.

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Auto Engine Wks., St. Paul.

ENGINE CLEANERS

Wagner Specialty Co., 1902 Broadway, New York.

FAN BELTS

Mechanical Belt Co., 2014 Frederick Ave., St. Joseph, Mo.

FIRE FIGHTING EQUIPMENT

Flexlume Sign Co., Niagara St., Buffalo, N. Y.

FORD STARTERS

Dayton Electrical Mfg. Co., Dayton, Ohio.

GARAGE EQUIPMENT

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Buffum Tool Co., Louisiana, Mo.
General Utility Co., 1338 Ogden St., Philadelphia, Pa.
H. G. Paro Co., 1410 So. Michigan Ave., Chicago.
Marvel Machinery Co., Minneapolis, Minn.
Romort Mfg. Co., Oakfield, Wis.
Storm Mfg. Co., Thompson, Iowa.
Zinke Co., The, 1223 So. Michigan Ave., Chicago.

GASOLINE STORAGE AND PUMPING SYSTEMS

The American Oil Pump & Tank Co., Cincinnati, Ohio.
Wm. B. Seafie & Sons Co., Pittsburgh, Pa.
Visible Gasoline Dispenser Co., 423 First Ave., Pittsburgh, Pa.

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I. S. Spencer's Sons, Guilford, Conn.

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Franklin Mfg. Co., 133 Market Pl., Baltimore, Md.

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New York Lubricating Oil Co., New York City.

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Dearborn Truck Co., 2015 S. Michigan Ave., Chicago.
Denby Motor Truck Co., Detroit, Mich.

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H. M. Boe Co., 2416 University Ave., S. E., Minneapolis, Minn.
General Utility Co., 1338 Ogden St., Philadelphia, Pa.

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PEDALS

Edw. A. Cassidy Co., Inc., Madison Ave. at 40th St., New York City.

PISTONS

American Machine Products Co., Marshalltown, Iowa.

PISTON RINGS

Butler Mfg. Co., Indianapolis, Ind.
Ever-Tight Piston Ring Co., 1609 Kingsland Ave., St. Louis.
Gill Mfg. Co., 357 W. 59th St., Chicago.
Inland Machine Works, 817 Mount St., St. Louis.
No Leak-O Piston Ring Co., Baltimore, Md.
Pondelick Bros., Leavitt St. and Jackson Blvd., Chicago.
Pruyn Ball Bearing Works, 1919 Michigan Ave., Chicago.

PUMPS

The W. H. Howell Co., 10 State St., Geneva, Ill. (Jensen Tire Pump.)
J. H. Haney & Co., Hastings, Neb.

RADIATORS

Detroit Auto Radiator Co., 180 Fifth St., Milwaukee, Wis.
Hooven Radiator Co., 519 Monroe St., Chicago.

RADIUS RODS

Gray-Heath Co., 1442 S. Michigan Ave., Chicago.

REPLACEMENT COILS AND RESISTANCE UNITS

New York Coil Co., 338 Pearl St., New York City.

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W. S. Burgess Mfg. Co., 1323 S. Michigan Ave., Chicago.
L. P. Halladay Co., Streator, Ill.

Philip H. Webber & Co., Hoopston, Ill. (W & C.)

SIGNS

Commonwealth Edison Co., 72 W. Adams St., Chicago, Ill. (Federal Electric Signs.)
Federal Sign System, Lake & Desplaines Sta., Chicago.
Flexlume Sign Co., Niagara St., Buffalo, N. Y.

SOLDER

Chicago Solder Co., 213 No. Union Ave., Chicago, Ill.

SOLDERING FLUX

M. W. Duntun Company, Providence, R. I.

SPARK PLUGS

Tungsten Mfg. Co., Marshalltown, Ia.

SPARK PLUG INTENSIFIERS

Universal Mfg. & Sales Co., 552 W. Harrison St., Chicago.

SPRINGS

Auto Spring Repair Co., 1321 Jackson Blvd., Chicago.
Garden City Spring Works, 2300 Archer Ave., Chicago.
Harvey Spring & Forging Co., Racine, Wis.
Jenkins Vulcan Spring Co., 1402 Chestnut St., St. Louis.
New Era Spring and Specialty Co., Grand Rapids, Mich.

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Jewell Electrical Instrument Co., 1650 Walnut St., Chicago.
Phillips Engineering Co., Dayton, Ohio.
Weston Electrical Instrument Company, Newark, N. J.

TIMING DEVICES

Beird Equipment Co., 324 W. Ohio St., Chicago.
Calculagraph Co., 30 Church St., New York.

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Kimball Tire & Rubber Co., 1469 S. Michigan Ave., Chicago.
American Accessories Co., Cincinnati, O.
Leo McDaniel Rubber Co., Cairo, Ill.

TIRE REPAIR EQUIPMENT

Akron Rubber Mold & Machine Co., 947 Sweetzer Ave., Akron, Ohio.
C. A. Shaler Co., Waupun, Wis.
Zinke Co., 1323 So. Michigan Ave., Chicago.

TIRE RENEWING

Leo McDaniel Rubber Co., 884 Commercial Ave., Cairo, Ill.

TRANSMISSIONS

Tractor-Train Co., 1344 S. Wall St., Los Angeles, Cal.

VALVES

Romort Mfg. Co., Oakfield, Wis.
A. Schrader's Son, Inc., 733-738 Atlantic Ave., Brooklyn, N. Y. (Automatic Inflating Valve)

VALVE REMOVERS

Buffum Tool Co., Louisiana, Mo.

VULCANIZERS

C. A. Shaler Co., 353 Fourth St., Waupun, Wis.
Vanderpool Vulcanizing Co., Springfield, Ohio.

WELDING APPARATUS

Berno Supply Co., Omaha, Neb.
St. Paul Welding & Mfg. Co., 173 W. 3rd St., St. Paul, Minn.

WRECKING TRUCKS

Robt. Holmes & Bro., Danville, Ill.

WRENCHES

The Graham Roller Bearing Co., Coudersport, Pa.

Index to Advertisements

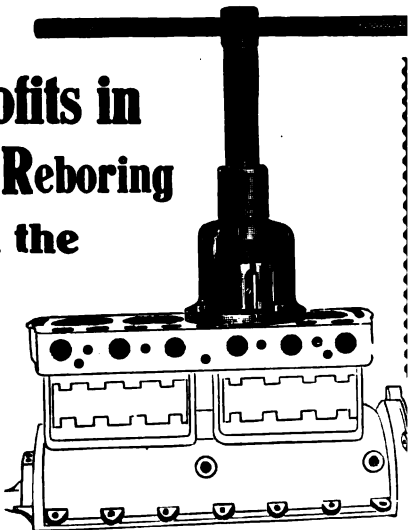
| A | | J | |
|------------------------------------|------------|---------------------------------|-------------|
| Advance Automobile Accessor- | | Jenkins Vulcan Spring Co..... | 62 |
| ries Corp. | 3 | Jewell Electrical Instrument | |
| Akron Rubber Mold & Machine | | Co. | 47 |
| Co. | 5 | K | |
| American Accessories Co. | 59 | Kennedy Car Liner & Bag Co. 56 | |
| American Bolt & Screw Case | | Kimoall Tire & Rubber Co. | — |
| Co. | 57 | L | |
| American Machine Products Co. | 52 | Lawrence & Co., L. | 58 |
| American Technical Society... | — | Lourie Mfg. Co. | 57 |
| Aske Automatic Voltage Regu- | | M | |
| lator Co. | — | McDaniel Rubber Co., Leo. | — |
| Atlas Auto Supply Co. | — | Marmon Chicago Co. | — |
| Auto Engine Works. | 58 | Marvel Carburetor Co. | 50 |
| Auto Parts Co. | 58 | Marvel Machinery Co. | 53 |
| Auto Spring Repair Co. | 56 | Mechanical Belt Co. | 47 |
| Auto Wrecking Co. | 58 | Miami Trailer Co. | 5 |
| B | | N | |
| Baird Equipment Co. | 57 | National Cash Register Co. | 43 |
| Beck & Corbitt Iron Co. | 56 | National Rubber Filler Co. | 55 |
| Bermo Co., A. J. | 56 | National Wire Wheel Works.. | 33 |
| B. & M. Mfg. Co. | 59 | New Era Spring and Specialty | |
| Brunner Mfg. Co. | 41 | Co. | 56 |
| Buettner Co., Chas. H. | 59 | New York Coil Co. | — |
| Butler Mfg. Co. | 58 | New York Lubricating Oil Co.. | — |
| Buffum Tool Co. | — | No-Leak-O Piston Ring Co. | 59 |
| Burgess Mfg. Co., W. S. | 49 | Norma Company of America, | |
| C | | The | 6 |
| Calculagraph Co. | 61 | P | |
| Cassidy Co., Edward A. | — | Paro, H. G., Co. | 57 |
| Inside Back Cover | | Phillips Engineering Co. | 56 |
| Catelain, Andre G. | 58 | Pondelick Bros. | 54 |
| Chicago Baling Press Co. | 59 | Pruyn Ball Bearing Works. | — |
| Chicago Solder Co. | 49 | R | |
| Commonwealth Edison Co. | 45 | Reliance Co. | 54 |
| Curtis Pneumatic Machinery Co. | 21 | Romort Mfg. Co. | 39 |
| D | | S | |
| Dayton Electrical Mfg. Co. | — | Shaler Co., C. A. | Front Cover |
| Dearborn Truck Co. | — | Schrader's Son, Inc., A. | 52 |
| Defender Auto Lock Co. | — | Spencer's Sons, I. S. | 59 |
| Denby Motor Truck Co. | 7 | Sprague Mfg. Co., E. H. | 58 |
| Detroit Auto Radiator Co. | 58 | Standard Auto Salvage Co. | 58 |
| Dunton Co., M. W. | 52 | States Chemical Co. | 8 |
| E | | Stewart, F. W. | 51 |
| Eccolene Company | — | Storm Mfg. Co. | 64 |
| Elgin Motor Car Corp. | — | Sunderland Machinery & Sup- | |
| Ever-Tight Piston Ring Co. | 50 | ply Co. | 58 |
| F | | T | |
| Federal Sign System (Electric) | 45 | Times Square Auto Supply Co.. | 53 |
| Flexlume Sign Co. | Back Cover | Tungsten Mfg. Co. | — |
| Foster Bros. Mfg. Co. | 59 | U | |
| Franklin Mfg. Co. | — | Universal Battery Co. | 21 |
| G | | Universal Mfg. & Sales Co. | 56 |
| Ganschow Co., William. | 52 | U. S. Air Compressor Co. | 29 |
| Garden City Spring Works. | 61 | V | |
| General Utility Company. | 4 | Vanderpool Vulcanizing Co. | 56 |
| Gill Mfg. Co. | — | Visible Gasoline Dispenser Co.. | — |
| Globe Mfg. Co. | 35 | W | |
| Graham Roller Bearing Co. | | Wagner Specialty Co. | 59 |
| The | 57 | Warshawsky & Co. | 58 |
| Gray-Heath Co. | 23 | Waxit Mfg. Co. | 25 |
| Greer College of Motoring. | 58 | Webber & Co., P. H. | 57 |
| H | | Weston Electrical Instrument | |
| Halladay Co., L. P. | 27 | Co. | 59 |
| Haney & Co., J. H. | 51 | Wisconsin Auto Top Co. | 55 |
| Harton & Co., Inc., Thos. J. | — | Z | |
| Harvey Spring & Forging Co. | 37 | Zinke Co. | 39 and 49 |
| Hinckley Machine Works. | 61 | I | |
| Hobart Bros. | 31 | Inland Machine Works. | |
| Hoffman Mfg. Co., Andrew. | — | Inside Front Cover | |
| Holmes & Bros., Inc., Robert. | 54 | J | |
| Hooven Radiator Co. | — | Jenkins Vulcan Spring Co. | 62 |
| Howell Co., The W. H. | 58 | Jewell Electrical Instrument | |
| I | | Co. | 47 |
| Inland Machine Works. | | K | |
| Inside Front Cover | | Kennedy Car Liner & Bag Co. 56 | |
| Inside Back Cover | | Kimoall Tire & Rubber Co. | — |

**AUTOMOBILE
SPRINGS**
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Big Profits in Cylinder Reboring

with the
**DAVIS
REBORING
JIG and
REAMER**



You can rebores old Ford cylinders, and by getting new pistons (1-32 inch oversize) you can make an engine as good as new. This is no exaggeration—old cylinders being thoroughly “seasoned out” are actually superior to new ones.

There is a big demand for this class of work among Ford owners and as soon as you are known to have the equipment, you will get your share.

With a Davis Reboring Jig and Reamer, one man can rebores a set of four cylinders in 60 minutes, and do as good a job as the large shops. And you make a good profit.

We also make a milling attachment for drill press.

Write today for particulars.

HINCKLEY MACHINE WORKS, Hinckley, Ill.

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| | | Elapsed Time 2 Hrs. 10 Min. |
| TIME ON JOB 12 168 2.10 | | STARTED JUN 1 1918 FINISHED JUN 1 1918 |
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CALCULAGRAPH

It records the elapsed time on repair jobs and thus gives you an accurate basis for repair charges. It eliminates errors, and settles disputes. It will soon pay for itself in your shop.

Write for Booklet

The Calculagraph Company

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NEW YORK CITY
Dept. 77**



When Springs Break

put on

VULCAN
QUALITY
VULCAN
The Replacement Spring



VULCAN Dealers are profiting by the demand created through national advertising and enjoying the benefits of a constantly developing spring replacement trade. Car owners everywhere know that VULCAN stands for supreme character in spring construction. They look for the VULCAN Service sign when the need for a new spring occurs.

Join VULCAN Service

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Become a VULCAN Dealer. It makes a big difference on the profit side of your ledger, and in the good will from your customers.

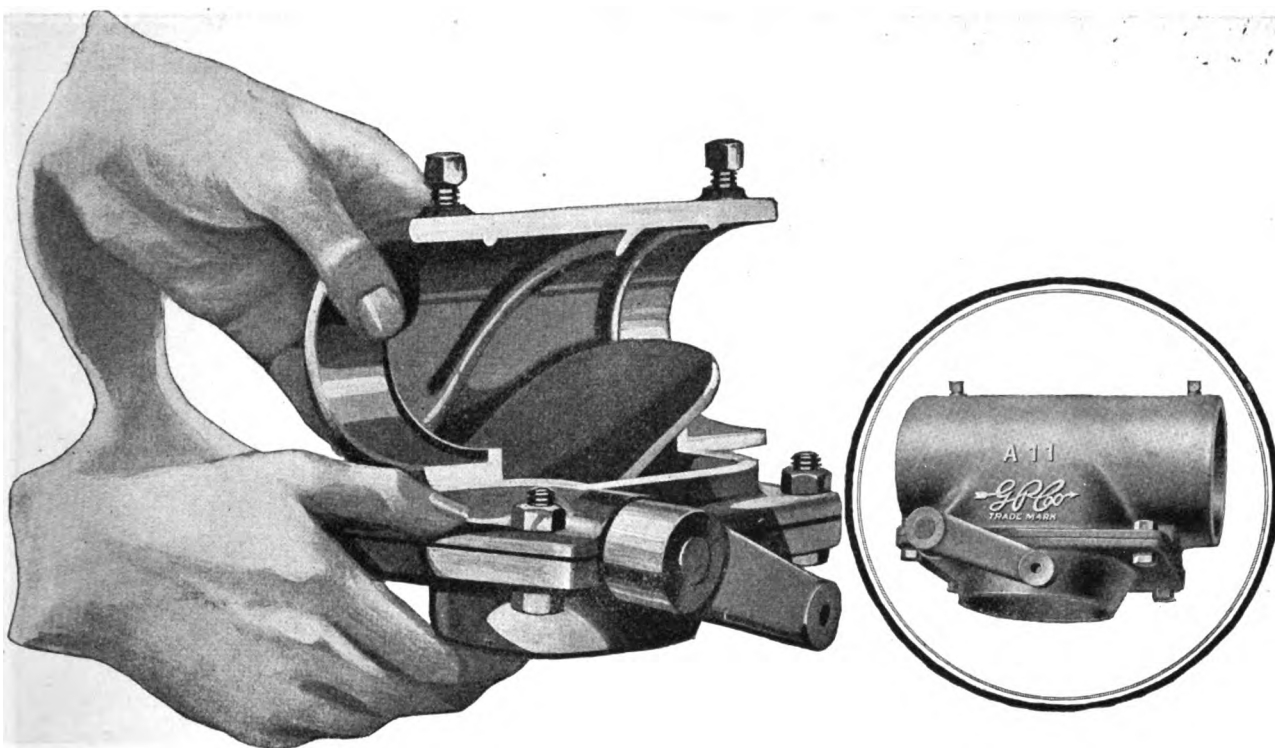
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Jenkins VULCAN Spring Co.
Richmond, Indiana.

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| | |
|---------------------|--------------------|
| Atlanta, Ga., | 48 Auburn Ave. |
| Dallas, Texas, | 2020 Main St. |
| Minneapolis, Minn., | 1024 Hennepin Ave. |
| Reading, Pa., | 538 Franklin Ave. |
| St. Louis, Mo., | 1402 Chestnut St. |
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JENKINS VULCAN SPRING CO. RICHMOND INDIANA



Is your motor cheating?

Do you know your motor's secrets?

CAN you tell when you are wasting power? How do you know all your cylinders are doing their full work? You may be wasting power and not know it—that means wasting gas and money.

There is only one efficient way to tell just how healthy your motor is. Put a G-Piel Muffler Cut-Out on your car.

The G-Piel Muffler Cut-Out will tell your motor's secrets. It is designed so that the carbon deposits cannot form and cause it to leak. Gases exhaust fully with no possibility of back pressure.

Sales Department

EDWARD A. CASSIDY CO., Inc.
Madison Ave. at 40th St., New York City
Manufacturers: THE G. PIEL CO., Inc.

The G-Piel Muffler Cut-Out

PIEL PRODUCT

"Tells the motor's secrets"



**STAVES SERVICE
FOR EVERY CAR
REPAIRING
PAINTING
WINTER TOPS
STORAGE**

Why Not a Sign You Can Change To Meet The Season's Needs ?

Why not put up a sign that will tell a new phase of your business story as often as you like ?

It is the new thought in electric advertising, this changing the message you flash on the street to meet the particular needs of the hour.

Your firm name on the street day and night in raised white letters would mean a lot, but think how much more it would mean to be able to call attention to the particular thing you are featuring.

It is easily done with an Oplex interchangeable unit sign like the one in the picture.

Each letter is mounted in a metal panel. To change the reading you just take out one set of letters and put in another. Anyone can do it in a few minutes, no lamps or wiring to change.

Nothing in its appearance shows the sign is interchangeable—just the regular, raised, snow-white Oplex letters on their dark background.

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The Flexlume Sign Co.

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Electric Products Corp.
Los Angeles, Cal.

Niagara St. and Potomac Ave.
Buffalo, N. Y.

Canadian Distributors:
The Flexlume Sign Co., Ltd.
Toronto, Ont.

AMERICAN GARAGE & AUTO DEALER



Published Monthly
115 So. Michigan Ave.
CHICAGO, ILL.

MAY

1919

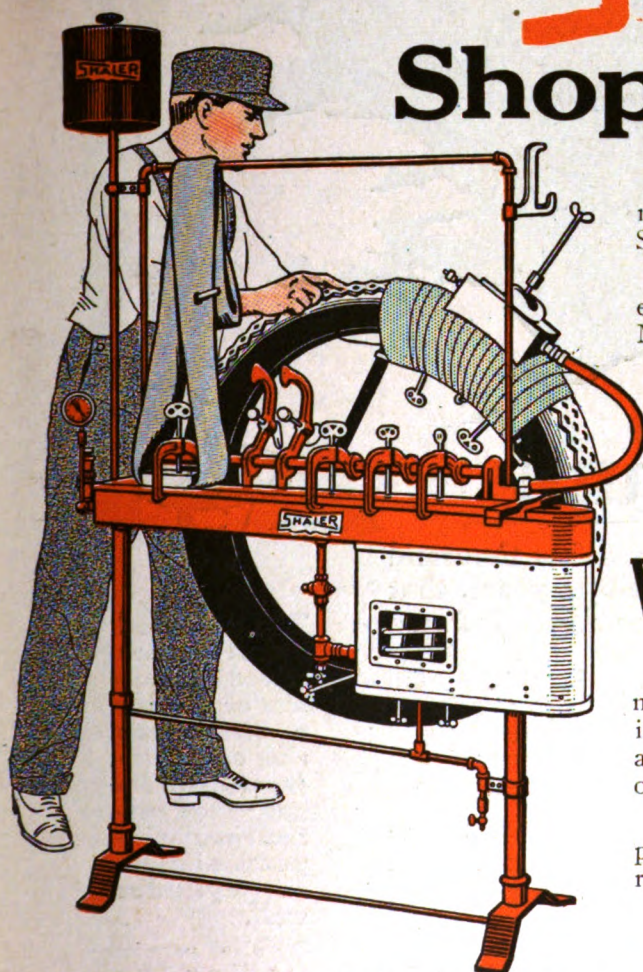
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10 Cents the Copy
\$1.00 Per Year

Make Money Repairing Tires

With a

SHALER

Shop Vulcanizer



Thousands of repairmen are making \$200 to \$500 and more a month clear profit, repairing tires with the SHALER Steam Vulcanizer.

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Anybody can quickly learn to operate it—we furnish tools, material and all the instructions you need.

Uses the Famous WRAPPED-TREAD Method

The Wrapped-Tread Method is used by nearly all tire manufacturers in making tires. It repairs every casing injury that it is practicable and profitable to undertake, and does it quicker, better and at less cost than any other method.

With the SHALER Automatic Heat Control it is impossible to overcure or undercure a tire—furnishes the right heat without watching or regulating.

Ask your jobber—Write for catalog

Type "N. P. R." Price **\$70**
Subject to Trade Discount

of the complete line of SHALER Vulcanizers for 'Repair Shops, Garages and Motorists' Use.

C. A. Shaler Co., 1354 Fourth St., Waupun, Wisconsin, U. S. A.
OLDEST AND LARGEST MANUFACTURERS OF VULCANIZERS IN THE WORLD

INLAND

1 PIECE PISTON RING



Climbing right up!

When the sales of a piston ring climb from a few thousand per annum to *millions* per annum in just a few years, that piston ring must have some *emphatic* advantages. It *has*.

**Inland sales are now on a basis
of *millions per annum***

simply and solely because the Inland has proved itself the *mechanically* perfect piston ring. Motor mechanics themselves were first to recognize its advantages and as a result thousands of them are actively urging motorists to install gas-tight Inlands.

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It also permits making the strongest and most durable construction—equal width and thickness all around, no weak or thin places.

FORDS GET AWAY

smooth and quiet--with

CORK ADVANCE **INSERT**

Transmission-Brake Lining

Advance Cork Insert takes the shivers out of your Ford. Driving becomes a series of smooth starts and easy stops.

Advance Cork Insert takes hold firmly but smoothly. Little pressure is needed on the pedals. The car comes to a graceful stop, without the jerks and jolts that cause all kinds of damage to your disposition and the car.

Another big smile in Advance Cork Insert is its economy. It outwears several sets of ordinary linings. Gives its wonderful service for so long a time that it's cheapest in the long run.

Be sure—next time you get your brake fixed—to have the garage or repairman put on Advance Cork Insert. He has it or can easily get

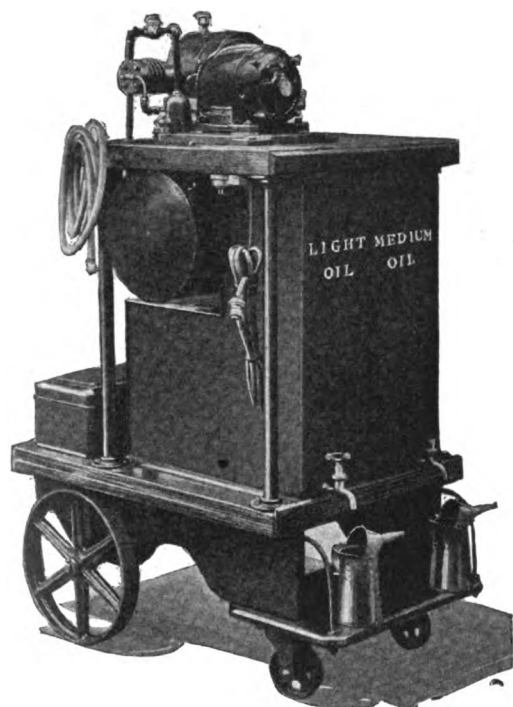
it. Sold by dealers everywhere. Carried by all wholesale houses. It is sold only in the red and black box with the name on it: "Advance Cork Insert."

**Advance Automobile
Accessories Corporation**

Dept. E-7, 56 E. Randolph St., CHICAGO



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THE advertising that we have been doing nationally for the past four months has resulted in securing for us many inquiries from all parts of the United States and many of these inquiries have been turned into direct sales.

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To such a concern we can definitely prove that they can make more money than they are making, by selling the GENERAL LINE, and will be selling a compressor that will give entire satisfaction to the automotive trade.

You are surely on the lookout for a good proposition and we have it to offer.

Let's get together now!

TWO-CYLINDER GENERAL AIR COMPRESSORS

Are constructed along the best mechanical lines and thoroughly guaranteed. They are made in eight different models suitable for the smallest as well as the largest garages. Prices on application.

Send for booklet "THE LOW COST OF COOL AIR"

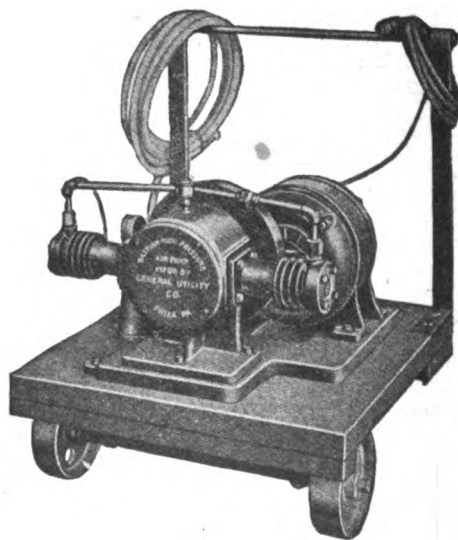
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Utilities Sales Corporation

Sole Factory Distributors

Suite 808, New Stock Exchange Bldg. Philadelphia, U. S. A.



Direct Portable Model

**In
boxes**

**In
rolls**



*"Next Best
to Cork Insert"*

*"Next Best
to Cork Insert"*

From Chicago to Frisco on one set of White Stripe Transmission Lining for Fords

Steep hills make the stiffest kind of a test for any Ford brake lining. This Chicago to San Francisco trip on one set of White Stripe Linings proved it quite in a class by itself. Crossing the mountains the wear and tear on the brake lining is something terrific.

Miles and miles must be made with the brake constantly in use. Ordinarily linings do well to last out three or four hundred miles of this kind of service. White Stripe linings went through whole trip with flying colors.

An ingenious and improved method of weaving, plus superior treatment, make White Stripe Linings far better.

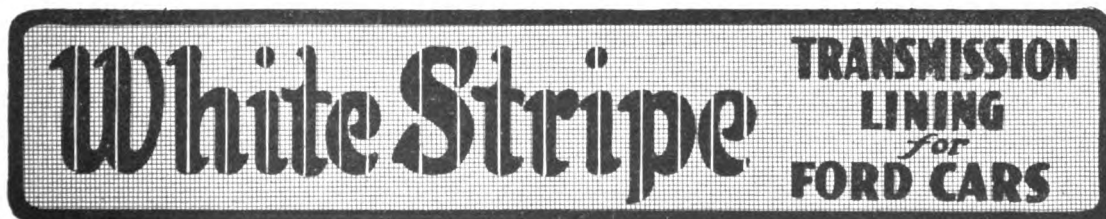
Each fibre is saturated by our secret treatment, to resist the burning and hardening action of hot oil. White Stripe lining stays soft longer and gives smoother, surer braking action.

White stripe is decidedly the leader for quality among transmission fabrics. You can instantly tell it, whether you buy from the roll or in the box. It is marked the entire length with the white stripe.

In boxes \$2 per set of 3
Rockies West, \$2.25; Canada, \$3

In rolls 32 cents per foot
Rockies West, 35c; Canada, 40c

Advance Automobile Accessories Corporation
Dept. E-7 56 East Randolph Street, Chicago, Ill.





"NORMA" PRECISION BALL BEARINGS

(PATENTED)

The war just ended was a war of men and machines — and victory came to the side with the greatest reserve force available at the critical time. The victories of peace will be won in the same way—and, in the industrial world the winning machine will be the one having the greatest reserve of power and endurance to draw upon.

"NORMA" Bearings have ever been identified with the ignition apparatus and lighting generators which were a part of the cars, trucks, tractors, power boats and airplanes that won. It was so before the war, and throughout the war. And it will be so, now that peace has come again.

Be Sure—See That Your
Electrical Apparatus
is "NORMA" Equipped.

THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings.



AMERICAN GARAGE & AUTO DEALER

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|--|----|
| Why Refuse Battery Service Profits?..... | 20 |
| Keep Customers Out of Repair Shops..... | 20 |
| Work for a Strong Organization..... | 20 |

GENERAL

| | |
|---|-------|
| The Valve of Service | 9-16 |
| Speeding Up the Turnovers | 10 |
| Cromer Brothers Sell Many Trucks and Tractors Around Small Town | 11 |
| Big Profits in Battery Business: \$100 Plant Gets All a City's Trade | 12 |
| Ball Bearing Makers Form New Combination..... | 12 |
| Farms to Absorb 2,000,000 Trucks in Next Ten Years, Is Estimate | 13 |
| Denby Concern Brings Out New Model 2 1/4-Ton Truck Motor Truck Express Is Successor to River Steamboat Line in Oregon | 13 |
| 20,000 Government Trucks to States for Road Work.. | 14-15 |
| Iowa Dealers Organize Motor Trades Bureau..... | 15 |
| Live Manufacturers Share Cost of Signs with Their Dealers | 15 |
| "Passenger Car" Designation Must Be Retained By Industry | 16 |
| A-C Spark Plug Concern Brings Out Speedometer... | 16 |
| Rewarding Men for Best Efforts Assures Small Labor Turnover | 17 |
| Highway Transport Course at Michigan University... | 17 |
| Sales Idea Winner Described | 18-19 |
| Experienced Rubber Men Run Standard Tire Plant... | 19 |
| Profanity of Garage Employee Postpones Car Sale Profit | 19 |
| ACCE\$SORIES, by M. E. Faber | 22 |
| Quick Adjustment Is a Burgess Feature | 22 |
| Jewell Gauge Described as Battery's Guardian..... | 24 |
| Spark Plug Men Boost Shows with Seven Color Posters | 28 |
| Tube Patch Firm Gives Dealers a Display Card..... | 28 |
| McKenney Is Western Manager for Denby Motor Truck Firm | 32 |
| Truck Rapid Transit Is Needed for Farm Produce... | 32 |
| Business Veterans Make Line of Champion Air Compressors | 36 |
| Window Displays Earn Profits, Practical Hints on Arrangement | 38 |
| Vulcanizer Sells So Fast Maker Enlarges Factory.... | 44 |

DEPARTMENTS

| | |
|--|-------|
| Readers' Questions Answered | 26-28 |
| Practical Hints for Shops | 30 |
| In the Truck and Trailer Field | 32 |
| Welding, Cutting and Brazing | 34-36 |
| Accessories and Garage Equipment | 40-42 |
| Buyers' Reference | 60 |
| Index to Advertisers | 61 |

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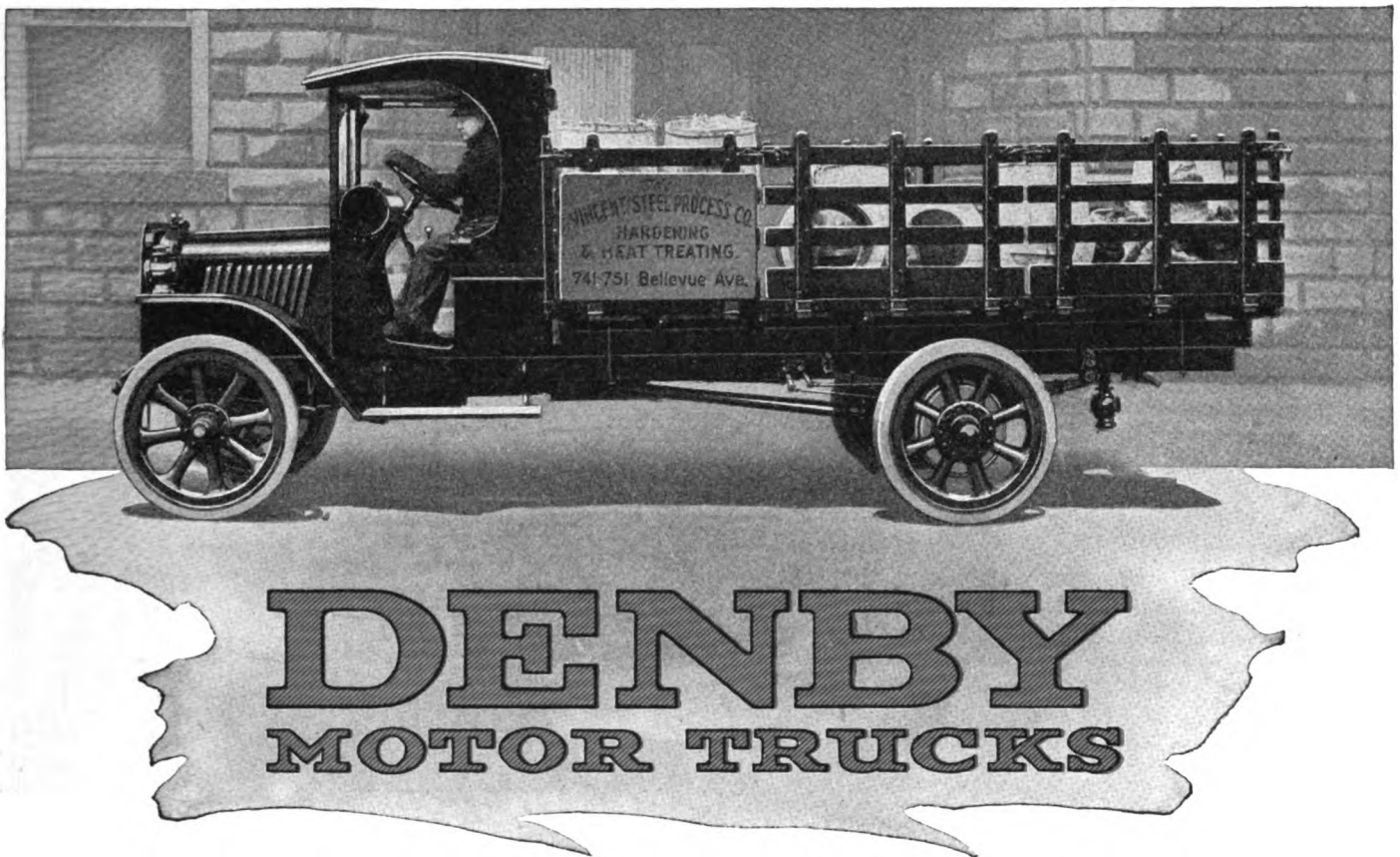
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THE new model 25 found immediate favor, particularly among the more experienced users of motor-trucks, who had long felt the need of a truck of this type.

Of medium capacity—2½ to 3 Tons—and relatively light weight—4450 pounds—it possesses that heavy duty construction throughout that heretofore has been obtainable only in vehicles of the heaviest tonnage.

The result is a truck of low operating cost, small upkeep, and the utmost dependability, capable of handling an unusually great tonnage per day.

*The Denby Line is Complete Ranging
From 1 to 6 Tons in Capacities*

Denby Motor Truck Company
Detroit **Michigan**

You and I -and Tire-Doh!

TEN years ago TIRE-DOH was just an idea, but I was positive that car owners by the thousands could be interested in a self-curing rubber repair—one that does away with patches and with vulcanizing.

We three—YOU and I and TIRE-DOH—have “put over” this big success! We have played a winning game, Mr. Dealer, and each of us is entitled to due credit.

You have proved your loyalty to TIRE-DOH—and your good business judgment, too—by pushing the best article of its kind on the market. I have done my part by standing right back of you with every possible selling help.

And TIRE-DOH? Well, the fact that over 750,000 motorists now use and “swear by” TIRE-DOH is sufficient evidence that the third member of the “triangle” is doing its part.

George W. Day

President
ATLAS AUTO SUPPLY CO.



Here's What One of the 10,000 “You's” Says:

“We have handled TIRE-DOH for over three years. It is the best selling item we have in our store.

We average from five to six dozen TIRE-DOH outfits per month the year round. In the summer season, when more cars are running, our sales of course run considerably higher.

TIRE-DOH is the best tire and tube repairer on the market. We have built up a big business on TIRE-DOH and our customers are all satisfied. Your selling helps are O. K. and help both of us.

Again will say we highly recommend TIRE-DOH.

Yours very truly,

CLARK HARDWARE COMPANY
Anderson, Indiana”



How We Help Tire-Doh Dealers:

TIRE-DOH is not only the BEST—and the BEST ADVERTISED—article of the kind on the market, but it is also backed by the BEST DEALERS' HELPS! We stand right behind TIRE-DOH Dealers with a selling service that is supremely successful.

If your business is LIMPING and LISTLESS—if it needs a “tonic” for that DULL FEELING—if your trade is SHRINKING and SLUMPING when it SHOULD BE SWELLING—we have in TIRE-DOH the magic medicine to stimulate your sales and add new customers to your list.

Our old dealers KNOW this—new ones should find it out! If you haven't yet handled TIRE-DOH write us today for our Dealers' Proposition. Come on—let's make it “YOU and I and TIRE-DOH!”

ATLAS AUTO SUPPLY CO.
680 W. Austin Ave., Chicago

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

AMERICAN GARAGE & AUTO DEALER

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
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Vol. X. No. 5

CHICAGO

May, 1919

The Valve of Service

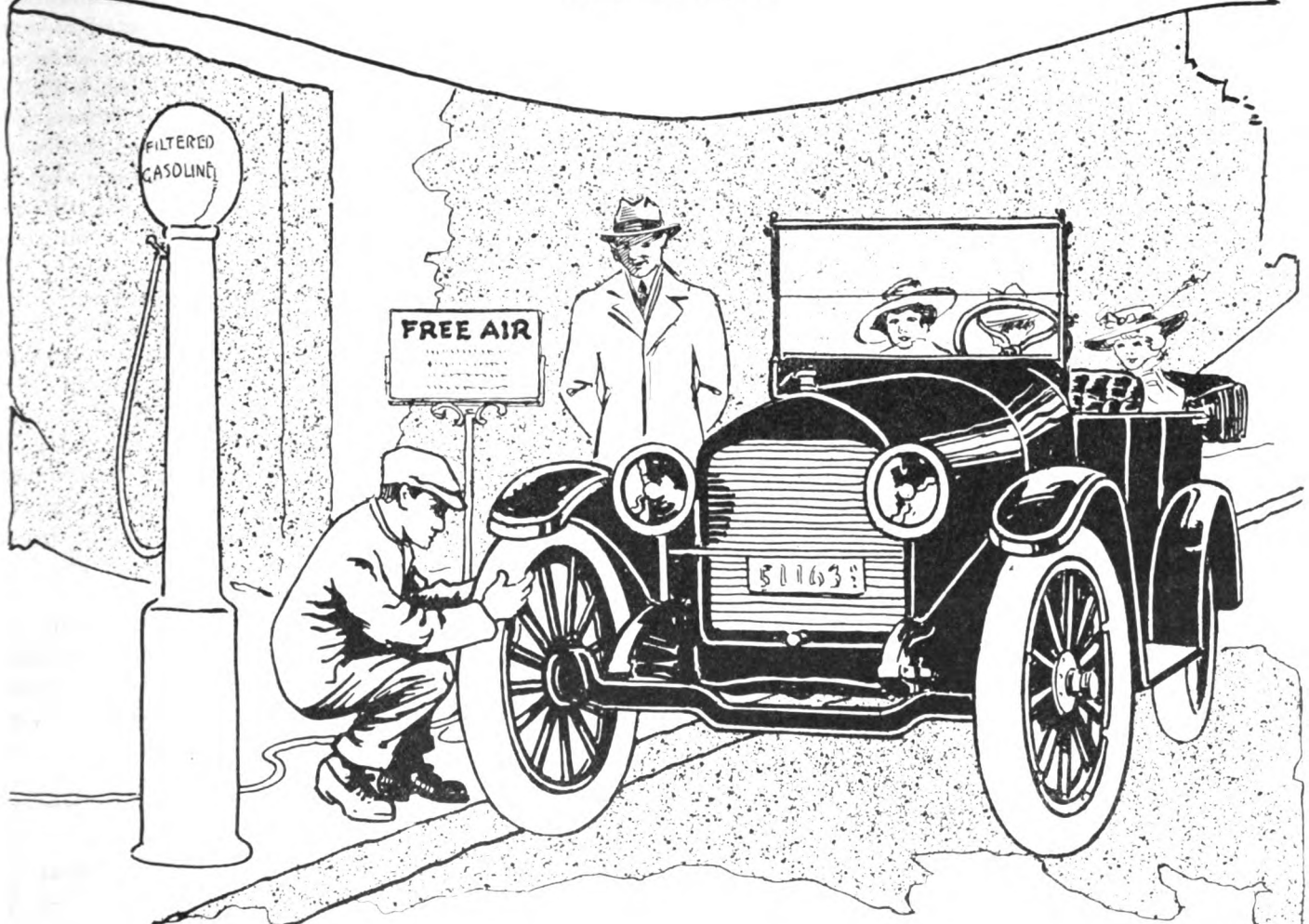
Now that the use of big pneumatic tires on trucks is increasing so rapidly, it is more than ever before necessary for every tradesman who caters to users of motor vehicles to be able to furnish compressed air for tires.

Most automotive dealers appreciate the business bringing value of having facilities to enable the rapid inflation of pneumatic tires. The few dealers who have not made

arrangements to obtain an air compressor of some kind ought to do so at once because the lack of this real necessary adjunct of a retail automotive establishment will be certain to keep a good many users of motor vehicles away.

It does not make any particular difference whether the air compressor is of the stationary type or the portable kind. Some dealers like the stationary air compressor

(Continued on page 16.)



Speeding Up the Turnovers

By **ROBERT FALCONER.**

At infrequent intervals wooden dams were thrown across a mountain stream to furnish power for a few saw mills. The total power and the total wealth developed by the stream was very small in comparison to its latent capacity.

An engineer surveyed the stream. He built masonry dams close together throughout its entire length. He transformed the water power into electricity, transmitted it to the nearby cities and made a huge fortune. In both cases the river was the same. Its capacity for producing wealth was the same. But the engineer made the river do more work. He increased the number of water wheels it drove. He speeded up the turnovers.

A man buys a business. He turns his stock but once or twice a year. Business is good but he makes no money. Bills due pile up. His creditors become impatient. He is driven into bankruptcy and is forced out of business.

Another man takes over the business. He turns the stock eight times a year. His profits keep increasing. Each year he has a large balance for outside investments. In a few years he becomes one of the wealthiest men in the city. In both cases the possibilities were the same. All the second man did was to make his capital work harder, to make it produce more wealth for him. He speeded up the turnovers.

In a small New Hampshire city there lived an erratic old fellow who kept a little store. One day a lady entered and asked for a can of tomatoes. He told her that he had one can left but had rather not sell it. He desired to keep a good variety in stock and if she could wait he would get her a can of tomatoes later.

This man never made more than barely enough money to exist upon. He wore cheap clothes, lived in the back room of the store and had no more than enough to eat. He was keeping a store, not running a busi-

ness. He kept his goods rather than sold them. He was not speeding up his turnovers.

Money Must Be Made to Work.

Money, like rivers, must be made to work to its utmost if it is to produce the greatest possible wealth. It cannot be allowed to lie idle, in stock that does not move. It cannot be allowed to become stagnant in goods stored in dusty, cobwebby warehouses. It must be kept constantly on the move. It must work continuously. No sooner should it be invested in one lot of goods than steps are taken to invest it in another lot of goods.

It is not the amount of capital a man uses in his business as much as how hard he makes that capital work for him that determines the amount of money he will make. It is not the amount of money used but the way in which it is used that counts. Annual profits depend upon the success with which the business man has been speeding up the turnovers.

New merchandise is a profit maker. Old merchandise is poison that not only eats up profits but capital as well. It is a poison that soon permeates the whole business system. Unless it is eradicated it will eventually kill the business. The strong, healthy business has no old shopworn merchandise eating out its vitals. It has fresh, new merchandise constantly flowing through it from the producer to the consumer.

Storing goods is fraught with danger. Selling goods leads on to success and wealth. Every business man has much to gain in the revitalizing of his business which will result from speeding up the turnovers.

Activity, Not Capital, Needed.

It is not capital that business men need to increase their profits. It is a vitalized active business. Some tiny city stores never carry enough stock to last them more than three or four days. The owners of these stores are making money. Practically the total capital invested is in fixtures, in over-

head that is necessary to carry on the business.

These men never fail. They always make money. They have no capital tied up in dead stock that is sapping the life out of the business. They need fear no competition. Their positions are impregnable because they are speeding up the turnovers.

A dollar invested ten times in a year brings in more net profits than ten dollars invested but once. One dozen each of six different items will sell six times as many as six dozen of one item. Six profits instead of one. The thinner you can spread your capital and still meet the demands of your trade the greater the profits you will make. The thicker you spread it, the greater the quantity of single items that you buy, the smaller will be your profits.

Every dollar more than is absolutely necessary that is invested in any one line of goods not only reduces the profits by just that much but also clogs up the business machinery and prepares the way for the sheriff and his red flag. There is but one way to guard against this. There is but one safe course to pursue. That course is to speed up the turnovers.

Bury Money in the Yard.

If you must bury your money bury it in the back yard where you can dig it up again. Don't bury it in idle stock where changes in value will probably prevent you ever getting it back again. Idle stock transmutes your money into dross. Active stock transmutes credit into pure gold.

Keep on the active side of the line and you become rich. Fall back to the stagnant side and you die in the almshouse. There is only one safe and sure way of maintaining your position on the profit side of the ledger. That is by speeding up the turnovers.

When business is slow, stimulate it by carefully thought out plans which just fit the time and condition.

Cromer Brothers Sell Many Trucks and Tractors Around Small Town

There is considerable business in selling trucks and tractors for the small town automobile merchant who gets out and hustles for orders, in the opinion of C. L. Cromer. With his brother, L. J. Cromer, he composes the firm of Cromer Brothers, who sell Ford cars and trucks and Fordson tractors at Napierville, 30 miles from Chicago. Napierville had a population of 3,449 when the 1910 census was taken and is a buying center for a prosperous farming district in DuPage county.

Cromer Brothers also sell the Lalley farm electric system and are now looking for a good salesman to look after that department, as the time of both brothers must be devoted mostly to selling Ford cars and trucks and the Fordson tractors. Their accessory business is showing a steady growth, especially since the Ford Motor Company has gone into this line so that they are able to buy from it on better terms than previously.

Like so many Ford dealers, they are behind on their orders for Ford cars because they cannot obtain them as rapidly as they can get the orders. C. L. Cromer says they have been selling one or two trucks a month for some time but that they will soon be doing much better, particularly as the farmers are starting to become interested in trucks. Three recent truck orders were received from farmers.

Trucks for Express Line.

Two Ford truck chasses were recently delivered to Frank McNally, a former railroad man of Napierville, by Cromer Brothers. Mr. McNally is having special furniture bodies built for the vehicles with which to carry couches and chairs into Chicago for a furniture factory at Napierville. Mr. McNally is now making a canvass of the Napierville merchants and arranging to bring merchandise of various kinds from Chicago to Napierville on the return trips when his trucks start to work.

Cromer Brothers now have 25



Mr. Cromer's Home-Made Chart.

Fordson tractors they have sold running on farms around Napierville. C. L. Cromer says that the farmers in their territory are greatly pleased with their Fordson tractors and he expects to continue doing a fine business with the tractor. He thinks that most farmers who have owned Ford cars will sooner or later buy Fordson tractors, if their farms are large enough to make the use of a tractor profitable.

The simplicity of the Fordson tractor is the biggest point in its favor. Mr. Cromer declares. He told of one buyer, who had previously owned another make of tractor and a Ford car, who took delivery of his Fordson tractor one day and they have never seen or heard from him since. Mr. Cromer said the farmer expressed the belief that he could operate the Fordson without any instruction and because the purchaser has not asked for any help or instruction, knows that the tractor must be running all right.

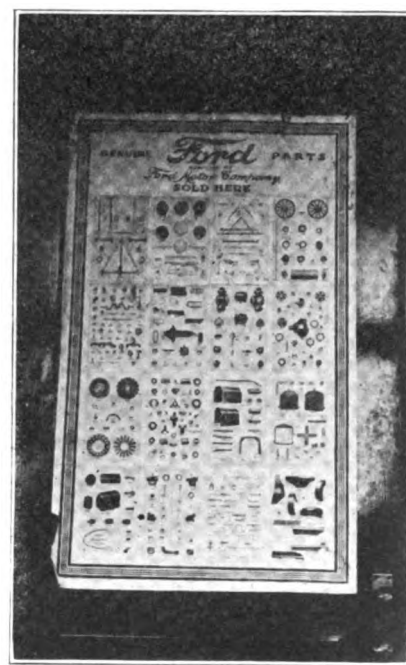
Tractors Easy to Operate.

Mr. Cromer also said that this was not an unusual case. Several other farmers, men who had never had any previous experience with tractors of

any sort had their machines at work in the fields the next morning after they had been delivered, when one of the Cromers drove to the buyer's farms to show the owners how to operate the tractors.

Cromer Brothers have a fine building, with offices and salesroom for cars and accessories in the street front. There is a well-equipped repair shop at the back in one end of their structure and they have storage space for a dozen or so cars. They have compressed air service but not "free air." The air hose is in a machine in front of their building and is operated by a nickel in the slot arrangement.

Cromer Brothers do a big business in Ford parts and C. L. Cromer is very proud of the home-made "parts chart," which he made himself, that is illustrated herewith. He made it by pasting on a big sheet of paper 21 pages of Ford part pictures taken from Ford Company's part catalogues. The recently introduced Ford parts chart, which does not show as wide an assortment as Mr. Cromer's chart, is kept on the door of the Cromer stock room and is also illustrated.



The Ford's Company's Chart.

Big Profit in Battery Business; \$100 Plant Got All a City's Trade

By C. M. ADAMS.

The mechanic straightens, slips his testing voltmeter back into his pocket and drops the box cover into position. "I thought so. Your battery's run down," he announces, pushing the seat cushion into place over the refractory cells.

"All right, fix it up then," the car owner replies.

The mechanic shakes his head. "Your battery's run down, I said."

"Yes, I understand."

The mechanic frowns. "We don't fix up batteries. You'll have to take it around to Smith's. He's the fellow that does that work."

This information is imparted in the tone of a family physician who has just informed the patient that he is suffering from appendicitis and now recommends a surgeon qualified to perform the necessary operation. It is delivered reprovingly, as if any intelligent car owner should know as a matter of course that Smith is the individual who must be consulted in a case involving battery trouble, quite as if the physician would explain, "You know I don't go in for this sort of thing. Jones is a good surgeon. He'll be able to fix you up."

Now for the practicing physician to suggest a skilled surgeon to perform such an operation is only proper. Elaborate training and technique which he does not possess are needed which he does not require in his general practice. But just why an otherwise qualified automobile mechanic persistently refuses to have anything to do with a storage battery is one of the unsolved mysteries of contemporary history.

Why Look at Battery with Awe?

Many mechanics look upon the battery with positive awe, as if it were governed by a set of supernatural principles impossible of ordinary human comprehension. Others consider it familiarly as a sort of modified dry cell into which electricity is pumped

much as compressed air into a tank.

But what is most amazing and inexplicable is the fact that of the rank and file of mechanics—not tinkers but qualified men capable of attacking competently any problem presented by ignition, carburetion or transmission—it seems safe to say that scarcely one in ten is familiar with the ordinary principles of battery practice.

And garages are little better equipped. In many large cities it is possible to have batteries recharged or repaired at only a few places, and in many smaller cities and towns this work is not done at all. There is seemingly a conspicuous lack of trained men and equipment to handle this phase of work for just what reason it seems difficult to determine.

The modern storage battery is not a thing of mystery. It is capricious, sometimes whimsical, but any mechanic who can cope with ignition and carburetion problems should be able to master its charging and simple repair technique without trouble.

Charging equipment offers even less difficulty. Where direct current service supplies light and power a switch and lamp bank resistance costing but a few dollars provides a simple mechanism for renewing the battery's power direct from the central station circuit.

Where alternating current service is supplied (as is now usually the case) it will be necessary to provide some means to convert the supply to direct current. But this is easily possible. Any of a number of mechanical or chemical rectifiers now on the market will do the work, or a small motor-generator set may be installed, either at an investment which is not large.

Monopolized a City's Business.

I know of an electrician who installed a small motor-generator set in a corner of his shop and because he knew something about charging and repairing storage batteries was

able to monopolize practically all the business of a city of 25,000 inhabitants.

His investment was about \$100. The space required in his shop was not large and the time occupied by the work was little. Yet because he was prepared to undertake this class of service he derived an income from this source which proved to be quite handsome within a year.

The storage battery has become too permanent a feature of the modern automobile to be overlooked as a possible source of revenue by the garage man who is on the outlook for every legitimate field of new business. Of course there are extreme cases in which an expert is required to inspect or repair a particular battery. But this is equally true of any other part of the car and should not prevent a garage man from making a bid for this class of business.

With one or two mechanics trained to handle the work and a charging set properly installed there is no reason why he cannot be in a position to acquire an appreciable volume of new business which will yield him a good profit and which in addition will achieve the desirable end of keeping every kind of his patron's work in his own shop.

Ball Bearing Makers Form New Combination

Under the title, S K F Industries, Inc., the Hess-Bright Mfg. Co., the S K F Ball Bearing Co., the Atlas Ball Co., and the Hubbard Machine Co., were combined May 1. The new concern offers a comprehensive line of ball bearings, including the Hess-Bright deep-groove type, S K F self-aligning radial and thrust bearings and ball bearing pillow blocks and shafting hangers.

S K F Industries, Inc., will be directed by the following officers: President, B. G. Prytz; vice-president, W. L. Batt; comptroller, J. P. Walsh; sales manager, S. B. Taylor. The main office is at 165 Broadway, New York City. Branches are maintained at Chicago, Detroit, Boston, Philadelphia, Buffalo, Cleveland, Atlanta, Cincinnati and San Francisco.

Farms to Absorb 2,000,000 Trucks in Next Ten Years, Is Estimate

BY GEORGE D. WILCOX,
Sales and Advertising Director,
Commerce Motor Car Company.

It is estimated that the farmers of America will absorb 2,000,000 motor trucks in the next ten years. We will see a big highway development and the truck will be more responsible than even the passenger car has been.

Statistics show that 73 1/5 per cent of passenger cars on farms were bought as a necessary part of the farm equipment; 24 2/5 per cent acquired for both business and pleasure, while the ratio for pleasure only among the farmers is 22 2/5 per cent.

There is more wealth on farms than ever before. The High Cost of Living has not hit farmers like city folks. There is a 30 per cent increase in prices for articles in common farm use, while farmers receive 60 7/10 per cent higher prices for their products.

For example: wheat went from 75 cents a bushel in June, 1914, to \$2.50 in June, 1917; and in September, 1918, it was around \$2.20 a bushel.

Some Price Changes.

Other price changes included: corn, 55 cents, December, 1914, to \$1.90 September, 1917, and \$1.60 last September; hogs, \$6, December, 1915, to \$17.50, September, 1918; cattle, \$5.75, December, 1915, to \$9.80, September, 1918. The housewife knows how butter and eggs have advanced. Wool went from 19 cents, January, 1914, to 58 cents, September, 1918.

Live stock prices January 1, 1918, were: horses, \$104.28; mules, \$128.74; milch cows \$70.59, other cattle, \$40.88; sheep, \$11.82, and swine, \$19.51. The estimated number of horses January 1, 1918, in the United States were 21,563,000; mules, 4,824,000; milch cows, 23,284,000; other cattle, 43,546,000; sheep, 48,900,000; swine, 71,374,000.

Farms also produce cotton, oats, potatoes, hay, rice, beans, cotton seed, tobacco, flaxseed, fruit, vegetables, etc.

With pneumatic cord tires one of the big arguments against the truck is

overcome. The farmer sees his work done quicker, with more efficiency and at less cost with a truck as part of his equipment.

It has been claimed that the proper kind of body has not been designed for the farmer, but this body is also here now. H. C. Bradfield, our advertising counsel, recently showed me photographs of a combination body that is ideal for the farmer.

Everything points to the huge development of the motor truck on the farm. The farmer is a cautious buyer, he will demand a reliable and accessible truck. He knows motor construction because he has owned a passenger car. If there is any place that service must be built in a motor vehicle it is where the farmer is concerned.

The farmer is more free of mortgage than he ever has been. The last statistics available shows a total of 3,948,722 farms in the country with 2,588,596 free of mortgages.

Take a truck of the Commerce class selling for \$1,500. In 1914 it would have taken 1,667 bushels of wheat to buy it, while in 1918 only 833 bushels were required; or cotton in 1914 it would have taken 15,675 pounds and in 1918 only 4,688 pounds; hogs in 1914 it would have taken 18,500 pounds while in 1918 only 8,900 pounds.

Two reasons might be cited why the truck has not been found on the farm in greater number—first has been the lack of education to the farmer of the necessity and second the heavy truck with solid tires. Both of these objections will be overcome in the 1919 truck merchandising campaigns—the solid tire objection is now removed by a number of the manufacturers offering the pneumatic cord tires as standard equipment.

Trucks will make farms attractive to labor. Motorized farms have a fascination that makes the work less burdensome and more attractive.

Denby Concern Brings Out New Model 2½ Ton Truck

Announcement has just been made that the Denby Motor Truck Co. at Detroit, has started deliveries of a new size Denby truck. The new product is styled Denby Model 25, and is of 2½ tons rated carrying capacity.

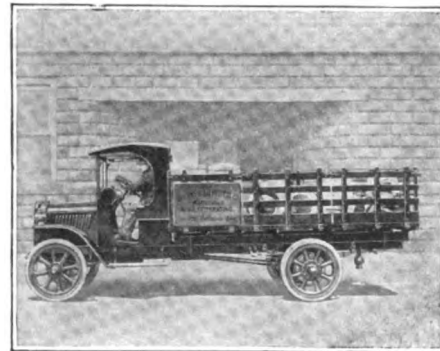
The Denby officials believe the new vehicle will meet the needs of a wide range of lines of business, as this size marks the meeting point of the two types of commercial cars, the light speedy vehicle and the ponderous heavy duty truck.

This new 2½ ton Denby combines the advantages of both types in an unusual degree. It weighs but 4450 pounds, and has a speed of 12½ miles per hour at 1275 revolutions of the motor per minute, factors that allow a wide radius of operation and assure excellent economy of fuel.

The truck is carried on wheels of cast steel. The tires used—front, 36x4, single; rear, 36x7, single giants, or 36x4 duals—are larger than are customarily used on a truck of this size. The frame is 5½ inches deep, 4 inches wide and ¼

of an inch thick. The springs are 44"x 2¼" front, and 54"x3½" rear, with grease pockets on each leaf. The load carrying axle is of chrome nickel steel, 3 inches in diameter.

The power comes from a 4 cylinder motor of 4¼"x5¼" bore and stroke. The motor develops 35 horsepower at a governor speed of 1275 revolutions per minute. The S. A. E. rating is 27¼.



Denby Model 25.

Motor Truck Express Is Successor to River Steamboat Line in Oregon

By F. W. FENN,

Secretary Motor Truck Committee,
National Automobile Chamber of
Commerce.

In the seventies Captain Hugh B. Scott began the operation of a light draft steamer on the Willamette River between Portland and Salem, Oregon. This was very much a business venture in those days and

Night and Day Service.

Three Federals are in use, two of 3½ tons and a two tonner, the heavy trucks making a round trip every 24 hours, thus giving day and night service. The two-tonner makes the round trip only on rush days, being used mostly on pickup and delivery work at Portland. The company contemplates putting on one-tonners at each

the region being fertile agricultural land. From these farms milk, butter, eggs, poultry, veal, hogs and vegetables are sent into market. The night truck brings in most of the farm products, arriving at best time to market such produce and bringing it in better condition.

The line has increased the production of farm produce by furnishing better mar-



Unloading Boxes at Aurora, Goods Brought from Portland.

few people believed the line would succeed. But it did.

The steamboat line was a success for a time, but the Southern Pacific Railroad furnished speedier transportation between these two points which almost wholly replaced the slower steamboats some years later.

Short haul lines are not profitable to the railroads, however, and the 55 miles between Portland and Salem is in this short haul class. It is on such hauls that motor trucks are demonstrating their value.

Such a motor truck line, The Highway Rapid Transit, has been in operation several months, and strange to say, E. B. Scott, the son of Captain H. B. Scott, is the man who first put on a fleet of trucks, just as his father first turned to the steamboats.

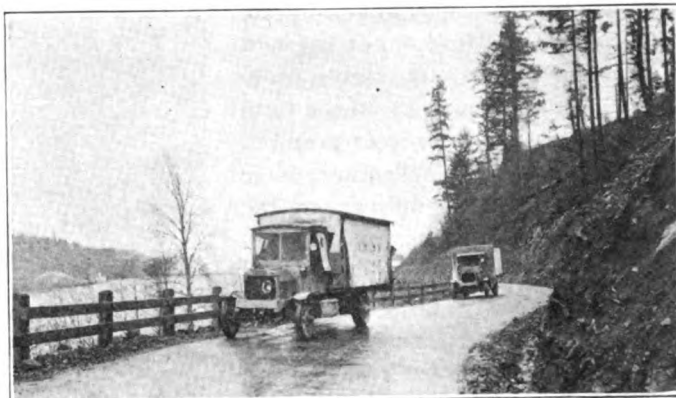
end for pick-up work, and using the two-tonner on regular schedule.

The freight rate ranges from 30 cents to 40 cents per 100 pounds. The line has had so much business that 5 tons have been carried every trip.

The main difficulty just now is some twenty miles of rather rough, and mud roads that mean slow going and some delay. This stretch lengthens the time to about nine hours for the 55-mile trip one way. Considering all necessary stops, however, this 110 miles every 24 hours is very good time.

Route Well Settled.

When the character of the country through which the line passes is understood, the value of the service is even more apparent. The entire route over the Pacific Highway is well settled, most of



Grade Leading West Out of Oregon City.

keting facilities. It enables the farmer to dispose of small lots of produce, milk or eggs, which otherwise would never reach the market. This increases the farmers' output and profits and because of added supply will tend to reduce prices to consumer.

The line also cuts out middlemen, as the farmer can send direct to the market. This is indeed a practical application of the principles of the Rural Motor Express as advocated by the Highways Transport Committee.

Three Counties Served.

The line passes through three counties, with stops at Portland and Fulton in Multnomah county; Clackamas, Oregon City, New Era, Canby and Aurora in Clackamas county; Hubbard, Woodburn, Gervais, Brooks, Chemawa and Salem in Mar-



Bad Roads Near Aurora.



Unloading Milk Cans and Crates at Canby, Oregon.

ion county, and many intermediate points as well as farms.

Two other important advantages of truck lines such as this is, store door delivery and "better than express" service. The first means no delay in receiving the shipment, as it will be delivered at door rather than relayed from train to railroad freight station, time taken to check lists and extra time for delivery.

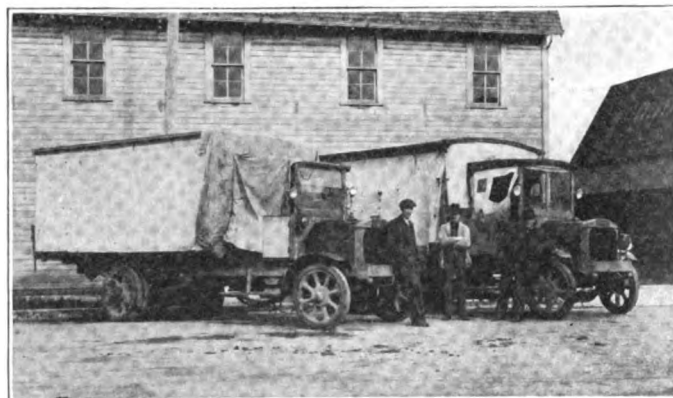
The "better than express" service means that the merchant can carry less stock, reducing his investment and increasing the turnover. The merchant can order by phone one day and get his goods the next morning, as it will be sent by night truck. All produce secured by these merchants can also be disposed of quickly and direct to the market.

The flexible, speedy motor truck line

with these advantages is giving new life to the small towns, villages and farming communities. Times have changed since Captain Scott first ventured to operate a steamboat line on the Willamette. Since the seventies the world has speeded up production which makes essential rapid, dependable transportation.

The motor truck has reached that stage which makes it a dependable medium for the development of the resources of farm,

forest, mine and ranch, providing rapid transportation of raw material and supplies to and from the outlying districts.



Trucks at End of Run in Front of Warehouse at Salem.

20,000 Government Trucks to States for Road Work

More than \$45,000,000 worth of motor trucks are about to be distributed by the Secretary of Agriculture through the Bureau of Public Roads to the State highway departments. These trucks have been declared surplus by the War Department and are being distributed to the States under the provisions of Section 7 of the Postoffice Appropriation Bill.

The vehicles must be used by the States on roads constructed in whole or in part by Federal aid, for which \$200,000,000 in addition to the former appropriation was given to the States under the same bill. All that the States must do to acquire the use of these 20,000 trucks, which range in capacity from two to five tons, is to pay the loading and freight charges.

Of the 20,000 motor vehicles to be acquired practically free by the States, 11,000 are new and 9,000 are used, but all are declared to be in serviceable condition. The trucks will be apportioned to States only upon request of the State highway departments on the basis of the requests received from the respective States, and in accordance with the apportionment provided in the Federal aid law approved in 1916. The requirements of the law forbid the Bureau of Public Roads to distribute any trucks to counties or individuals.

Promptness is a virtue the business man must never lose sight of. He must be prompt himself in his hours, in his obligations, and in his business arrangements. Loss of time is loss of money; loss of credit is loss of prestige; loss of the advantage through early preparation means playing directly into the hands of your competitor.

Live Manufacturers Share Cost of Signs with Their Dealers

Who should pay for the sign?

This is a question which has given some little concern to dealers and manufacturers in the past. The dealer holds that if the sign features the manufacturer's name and helps to sell his product that he should pay for it. On the other hand the manufacturer argues that the dealer will benefit by every sale the sign brings in and that he should stand the cost.

The truth of the matter is that both are right, and manufacturers are coming more and more to admit this. Many are standardizing on a distinctive style of Oplex sign for the reason that this type lends itself best to the exact reproduction of their trademark. These signs they are placing over dealers' doors where they are able to make the necessary arrangements.

The cost of the sign is usually divided between the manufacturer and the dealer. In this way the dealer gets a sign of the very highest quality. The manufacturer has a means of connecting his national advertising with the dealer's location in a way that is more forceful and sales compelling than any other he could find.

So here is a hint to dealers: Find out if the manufacturer whose line you are handling is not thinking of standardizing on Oplex signs. You may not have heard that he has gone in for this form of advertising, but that does not prove that he has not. There are many manufacturers who are trying out the plan on a small scale, putting up signs for just a few dealers.

The only way you can be sure is to write and ask him, and if he is not already doing something along this line suggest that he get in touch with the Flexlume Sign Co., Buffalo, N. Y. This concern will show him how his trade name can be perfectly

reproduced in Oplex characters of raised white glass on a dark background, the sign that will bring business for you 24 hours a day.

AUTOMOTIVE NEWS NOTES.

President Charles Clifton of the National Automobile Chamber of Commerce has appointed the following as a show committee for the 1920 passenger car exhibitions: John N. Willys, Chairman (Willys-Overland); H. G. Root (Westcott); H. M. Jewett (Palge).

Geo. T. Briggs, former sales manager of the Wheeler-Schebler Carburetor Co. at Indianapolis, is now manager of Opaline motor oils of the Sinclair Refining Co., Chicago.

President T. B. Jenkins of the Jenkins Vulcan Spring Co. announces that the St. Louis branch of his concern was moved to Kansas City, Mo., May 1.

H. H. Simmons, formerly with Simmons-Boardman Publishing Co. for fourteen years, has become interested in the John H. Cross Co., 327 S. La Salle street, Chicago, which hereafter will be known as Cross & Simmons.

E. E. Schwarzkopf, founder of Automobile Topics and a pioneer of the automobile industry in this country and Europe, is about to launch a new publication. It will be known as The Automotive Exporter and be printed simultaneously in Spanish, English and French.

J. H. Turner has sold his interests in and resigned as president of the Turner Advertising Co., of Chicago. Mr. Turner and his associates have organized the Turner-Wagener Co., Inc., and opened offices at 28 E. Jackson Blvd., Chicago. The new concern will handle advertising, merchandising, and selling campaigns. Mr. Turner announces that his concern has applied for membership in the American Association of Advertising Agencies, with which Mr. Turner was connected when president of the Turner Advertising Co.

The Valve of Service

(Continued from page 9.)

best because it permits them to have several lengths of air hose attached to the feed pipe so that tires may be pumped up at different places around their establishment.

When the stationary compressor has been installed the feed pipe can be tapped so that the tire repair man will have a hose near at hand with which to test repaired tubes, and one or more other sections of hose can be attached to the feed pipe at the various points where air will be often needed.

The portable air compressors that can be moved around the shop or garage on their wheeled platforms are preferred to the stationary kind by some users. They are especially adapted for use by garage owners or repair shop men who at different times may have men working on vehicles both inside and outside of their buildings.

The main idea is to have a supply of air and each automotive tradesman must decide between the portable and stationary types of compressors by selecting the kind best fitted for his own needs. Be sure to have an air compressor, whether portable or sta-

tionary. There are some retail automotive establishments that have so much work to be done that they have both kinds.

While perhaps the majority of dealers run this end of their business on the "free air" basis, it is by no means necessary that compressed air for tires be furnished without charge. Many dealers make it a practice to furnish free air only to their regular customers or to transient customers who purchase gasoline or accessories or have some mechanical work done, charging a small fee to those who simply wish to have tires blown up. A practice of charging 5 cents for compressed air service, by means of a nickel in a slot attachment, is one that has been adopted by some garage men and service station owners, particularly those whose places are located where many tourists pass their doors.

The tradesman who really wishes his air supply facilities to represent "the valve of service" should have a table giving the inflation figures for different weights of cars and sizes of tires posted where air users can see it. This is done in some cases by having these figures on a board mounted

near the place where the air is to be obtained. A board showing the load and inflation table can in some cases be best attached to the wall or it can be mounted on an iron standard.

One of the simplest ways to prepare such a table is to have the figures typewritten on a sheet of paper and attach this sheet to a board. A coat of shellac painted over the paper will protect it from the weather as well as improve its appearance. The proper inflation figures for the most generally used sizes of tires are given below. A complete table, including inflation figures for motorcycle tires and heavy truck tires, will be printed in the Tire World department of this journal in the June issue.

Inflation Schedules

Cord Tires.

| | | | | |
|----------|---------|-------|------------|------|
| 3"..... | 45 lbs. | ..... | 375 lbs. | load |
| 3½"..... | 50 lbs. | ..... | 570 lbs. | load |
| 4"..... | 60 lbs. | ..... | 815 lbs. | load |
| 4½"..... | 70 lbs. | ..... | 1,100 lbs. | load |
| 5"..... | 75 lbs. | ..... | 1,300 lbs. | load |
| 5½"..... | 80 lbs. | ..... | 1,700 lbs. | load |

Fabric Tires.

| | | | | |
|----------|---------|-------|------------|------|
| 3"..... | 45 lbs. | ..... | 375 lbs. | load |
| 3½"..... | 55 lbs. | ..... | 570 lbs. | load |
| 4"..... | 65 lbs. | ..... | 815 lbs. | load |
| 4½"..... | 75 lbs. | ..... | 1,100 lbs. | load |
| 5"..... | 80 lbs. | ..... | 1,300 lbs. | load |
| 5½"..... | 85 lbs. | ..... | 1,700 lbs. | load |

"Passenger Car" Designation Must Be Retained by Industry

Since the war too many motor scribes are drifting back into the old habit of designating automobiles as "pleasure cars" instead of referring to them by their true and logical name—"passenger cars," John C. Wetmore writes in the *Evening Mail* of New York City.

Than Edward F. Korbel, press agent of the New York and Brooklyn automobile shows and other of New York's big exhibition enterprises, no man is better informed as to the trend of motor news and editorial comment on doings of the dealers throughout the country.

"I am much surprised and disappointed," said he in a little talk I had with him, "to notice since the war ended a by no means small tendency on the part of the newspapers to drift back into the use of 'pleasure cars' as a designation for the now accepted and more proper term 'passenger cars,' against which so vigorous a campaign has been urged by the Chamber of Com-

merce and the American Automobile Association.

"I account for the present backsliding from the fact that many motor writers have drifted back from the service into their old jobs, and really are ignorant of the reform in automobile nomenclature that was brought about during their absence.

"This use of the 'pleasure car' designation has brought the sport and industry no end of trouble in the way of discriminating and unfair national and state legislation through legislators accepting the false and misleading designation given to automobiles by the motoring writers themselves.

"Chairman Batchelder, of the A. A. A. executive committee, and Alfred Reeves, general manager of the Chamber of Commerce, will tell them how much trouble has been caused by this unnecessary creation of a false impression in the public mind."

AC Spark Plug Concern Brings Out Speedometer

Confirming rumors that the Champion Ignition Company, manufacturers of AC spark plugs, had decided to manufacture speedometers, Albert Champion has announced that production of the new AC speedometer, which is of the magnetic type, will start this month. One automobile company will use 140,000 AC speedometers next season.

At the conclusion of the armistice, last fall, more than 40,000 AC aviation spark plugs per day were being turned out for the Government. The immense plant built to take care of government work will be taken over for the manufacture of AC spark plugs and speedometers, but even with this additional space, it is probable that enlarged facilities will be required before the first of the year.

The speedometer development and manufacturing departments will be under the direct supervision of Jo. Berge, recognized throughout the industry as one of the real veterans and one of the leading experts on speedometers in this country today.

Rewarding Men for Best Efforts Assures Small Labor Turnover

While the plan outlined below in Mr. Jordan's article, which appeared in *System*, was used in a big factory, the same ideas can be applied in smaller plants and repair shops. One of the strongest arguments for the adoption of some sort of a method dealing with employees similar to the one used by Mr. Jordan is given when he tells that the labor turnover in the Jordan plant was only about one-half that of neighboring manufacturers.

By **EDWARD S. JORDAN**,
President
Jordan Motor Car Co.

"How do the men in the plant feel about it?" the chief may ask.

"Well, I was talking to Joe Watkins and Steve Sladek and Vic Corigi," the superintendent will answer. "They say there's a good deal of grumbling, but they don't believe that anything will come of it. Joe says we're right and the men are wrong, and he is going to tell 'em so."

"Oh," the chief will sigh in relief. "Then we're all right. We won't have trouble."

Every factory—and every office, for that matter—has its Joe and Steve and Vic. Steve may be a bench hand, Vic a foreman, Joe a machinist. But whatever their jobs, they are the natural leaders; what Joe and Steve and Vic say—that is what the men go by. And it pays in real profits to have them on your side.

Joe, the machinist, may be more valuable to the company than is his foreman, though he may lack entirely the foreman's essential knack of teaching the other fellow how to do it. Is there some way to recognize Joe's ability and make sure that he will not take himself and his gift of leadership to some other concern? There is, we have found, a very effective way.

Plan Holds Leaders.

I am going to describe a little plan that we have been using for about three years in our plant. It has held our natural leaders, and has consequently helped greatly in reducing our whole labor turnover. Where the leaders are not restless, we have proved to ourselves, the whole force of employees is likely to be stabilized.

As a preliminary, let me say that we pay for loyalty in wages, and not in anything that goes under the inclusive title of welfare work, although we by no means ignore the latter. We do not underestimate the value of pleasant relations between employee and employer. But we believe that, given a management of normally friendly executives the best

way to maintain pleasant relations is to pay good wages.

Now for the plan itself. Every month each foreman is required to turn in to the superintendent the names of every man whom he regards as indispensable to the department. And "indispensable," we let them know, means not only such employees as the highly skilled operators whom we could not replace without considerable effort and expense, but also leaders of the Joe Watkins type—men, for instance, to whom the foreman feels he may turn over his department for an hour or two when he himself must be absent.

The superintendent checks this list against his own knowledge of the men; he adds a name here or there, as he finds a good man overlooked, and occasionally scratches off a name that he recognizes as the result of partiality. He makes out, too, a list of "indispensable" foremen, and passes along both of the lists to me.

Best Men's Pay Raised.

I keep the lists and go over them carefully every month, comparing the names on the most recent sheets and watching for those which appear regularly. The names of the men with the best showing over a couple of months I am likely to copy off onto another sheet of paper and send to the accounting department for a raise in wages of 5 or 10 per cent.

These raises go into the pay envelopes without any comment or notice to the men who get them. When the workman counts his money he finds it. And he finds it every week thereafter.

About twice a year we go over these bonus lists and pick out the very best men. We give them a little raise again, even though the wage scale for their kind of work has not risen. And in this way we keep on recognizing with additional pay the men whose leadership or mechanical skill makes them more than ordinarily valuable to us.

Will this method, as time goes on and the little increments gather, not prove burdensome to us, and saddle us with an extra payroll expense beyond that particular man's worth?

Leaders Progressively Valuable.

I hardly think it will. Employees of this class are progressively valuable as their length of service increases. The men of unusual mechanical skill tend to become the pivots around which departmental production revolves. If they leave, departmental output decreases. And the loss in production that comes while one department is without a pivot

man will more than outbalance the excess wages we pay in several months to our "indispensables."

Similarly, the influences of the natural leaders increases as they become "old-timers" in the plant. The men who receive the extra money show no great inclination to talk about it. They accept it gratefully, give increased loyalty for it, and realize that they have been singled out for some valuable qualities that they possess—just what qualities, they do not always know.

The other men in the plant know vaguely that some few men get a little more pay than they do. But they don't know exactly which men these are; and they seem to feel no resentment because these men are singled out.

The results, in figures, may seem a little more impressive. Here they are: Situated as we are in a manufacturing district where jobs were always plentiful and wages high, our rate of labor turnover in 1918 was 30 per cent as contrasted with an average among our neighbors of nearer 55 per cent. Of our "indispensables," only twelve left us during the year; and all of these went into the national service.

Doesn't that prove that the plan is a good one?

Highway Transport Course at Michigan University

A new epoch in the nation wide good roads movement is seen in the announcement by President H. B. Hutchins that the University of Michigan will establish a course in highways transport.

The new course is designed to train an army of experts to direct the coming expansion in road building and highways transportation. It is believed that thousands of men who have been trained by the army in the haulage of freight over the roads will want to round out their education by going back to college in preparation to making highways transportation their life work.

Many other students also have indicated their desire to enter this new field of endeavor and these with the former army men will make up the first classes. The students will take up automobile engineering, various phases of the transportation question as presented by the department of economics and highways engineering, as it is now recognized that the road-bed and the highway vehicle that travels it are as closely related as the rolling stock and the road bed of the railway line.

Sales Idea Winner Described

As we promised in our April number, we are showing herewith a photographic reproduction of the Christmas circular gotten out by C. H. Wooden of Lamar, Colo., that captured second prize in our Sales Idea contest. The circular was printed for the Lamar Motor Sales Co., of which R. L. Christy is manager, and Mr. Wooden, assistant manager.

Each side of the circular is shown in the illustration as well as the way the circular looked when it was folded up ready to be handed out to callers at the Lamar showroom or ready to put in the mail after the name and address had been filled in on the lines shown between the two tires.

to be given for Christmas presents. One line of the circular read as follows: "Wake the family Christmas morning with a new car chugging away."

Mr. Wooden won second prize in our advertising contest that closed August 1 last and he has written some articles for this journal under the pen name of "Dike."

On one side of the circular, under the picture of Santa Claus putting his head through a wreath, Mr. Wooden gave what might be called the business creed of the Lamar Motor Sales Co. This was entitled "to build it our motto," and was as follows:

"We want to build up. We ask your

America's markets for High Grade Standard Merchandise. We are young yet. We might get some little item that was not Standard. But if we find that out, out it goes.

"We want to feel that for every dollar you spend with us you get value received. You don't find Tire Seconds here. You don't find Pumps that cause you to Swear and Cuss. You don't find off brand Spark Plugs or Cotton Robes. But you find Dependable Merchandise with the maker's and our own guarantee.

"We are going to build this business on Smiles and Service. Cause you to smile and build our service so that you will always come back. We have grown from a wheelbarrow load of Standard Merchandise in 1917, until now the People say our Little Auto Store is the best in the Valley. They all say it's the most interesting place for those who motor.

"Manager Christy—everybody knows Bob Christy—will be on the job all the time after January, to help build our business up and to offer our Customers better service.

"Now the writer wants to tell every last one of you that he sure appreciates the patronage that you have given us and appreciates every visit you have paid us. We both extend to you, your family and friends an invitation to pay our store of Service and Quality a visit, and we will show you that **BY TRADING AT OUR LITTLE SHOP, HERE ON MAIN STREET, YOU WILL FIND IT A PROFITABLE PLEASURE.**

"Again thanking you and asking you to help us **BUILD BIGGER BUSINESS**, we remain, Everybody's Friend, **"THE LAMAR MOTOR SALES CO.,**

"By Charley Wooden, Asst. Mgr."

H. E. Rose, who won first prize in our Sales Idea Contest, started in the automobile business in 1910 at Sioux City, Iowa. In 1916 he began to sell motor trucks when the Van Brunt Automobile Co. at Omaha took on the distribution of the Fulton. In 1915-16 Mr. Rose gained some experience handling tractors as the Van Brunt Co. had him look after both the tractor and truck departments of its business. Mr. Rose went with the Fulton factory organization last summer, and a couple of months ago resigned as sales manager of the Fulton factory force to become vice president and general manager of the Fulton Truck Company of Illinois at Chicago.

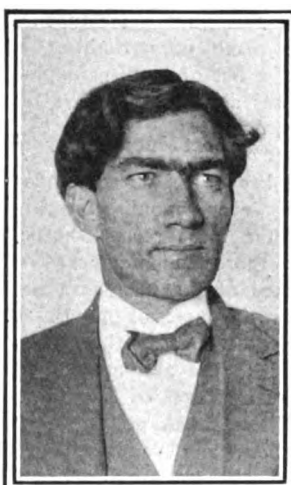
Charles Olive of Willmar, Minn.,



H. E. Rose.



C. H. Wooden.



Charles Olive.

The small card below was an ordinary envelope size, and was printed in red and green. The message that appeared on it was:

Holiday Greetings.

With sincere good wishes for your Health Happiness and Prosperity.
The Lamar Motor Sales Company,
R. L. Christy, Manager.

When Mr. Wooden mailed the circular to us December 28 last as his entry for the contest he wrote that it had attracted lots of attention. He said sales results were very good, especially considering there was snow 22 inches deep.

In addition to showing pictures of Dodge cars and Republic trucks, the circular calls attention to a number of accessories that would be good things

help. We must merit it if we get it. That's our job.

"We seek to please the patrons of our little Auto Store because we know the success of our business and ourselves lies in retaining your Friendship, Good Will and Continued Patronage. We ask you to come and see us. We want you to know us. We want to know you.

"Now we realize that not every one wants a Dodge Brothers or Hudson Automobile or a Republic Truck, but we say come and see us. Our motto is give the Same Service on a French Flasher Battery or Valve Core as we would on a \$5,000.00 Truck.

"Merchandising Automobiles and Automobile Merchandise is our Business—that's it 365 days in a year.

"Our stock is growing every day. War conditions have been so that merchandise was hard to get, but the better times are coming and we will search

who annexed third prize in our Sales Idea Contest, was just starting in the automobile agency business when this country entered the war, and he was obliged to give it up because he could

not obtain enough cars to keep going. He expects to go back into the business in the near future. He believes that a dealer in a small place should use his country papers as much as pos-

sible for advertising and they should also get up a selling plan that is different enough from those used by their neighbors to attract favorable attention from prospective customers.

Experienced Rubber Men Run Standard Tire Plant

A group of experienced rubber men, principally from Akron, have acquired the factory, good will and entire business of the Standard Tire & Rubber Co., Willoughby, Ohio, including a branch store at Cleveland. The new concern starts with a capital of \$500,000. Arrangements are being made to greatly increase the factory production, which is now confined to fabric and cord pneumatic tires, and red and gray inner tubes.

R. J. Firestone, president of the Standard concern, was formerly vice-president and sales manager of the Firestone Tire & Rubber Co.; E. A. Tinsman, first vice-president, was formerly factory manager of the Portage Rubber Co.; C. A. McCulloch, second vice-president, is manager of the Frank Parmelee Co., Chicago, and treasurer of the Thompson chain of restaurants; Tom A. Palmer, secretary and treasurer, was formerly an official of the Diamond Match Co. and the Granite Clay Co. at Akron.

Profanity of Garage Employee Postpones Car Sale Profit

By M. E. FABER.

"Every day as I walk to the car line," said one of the soon-to-be car owners I know, "I go past a garage that handles a certain make of car that I've had my eye on for several months. I'm about ready to buy a car but I haven't room for a garage of my own and for the present I would have to depend on this particular dealer's place for storage."

"The trouble is that somebody in there is one of the most fluent cussers I have ever heard and his bull voice carries clear out into the middle of the street.

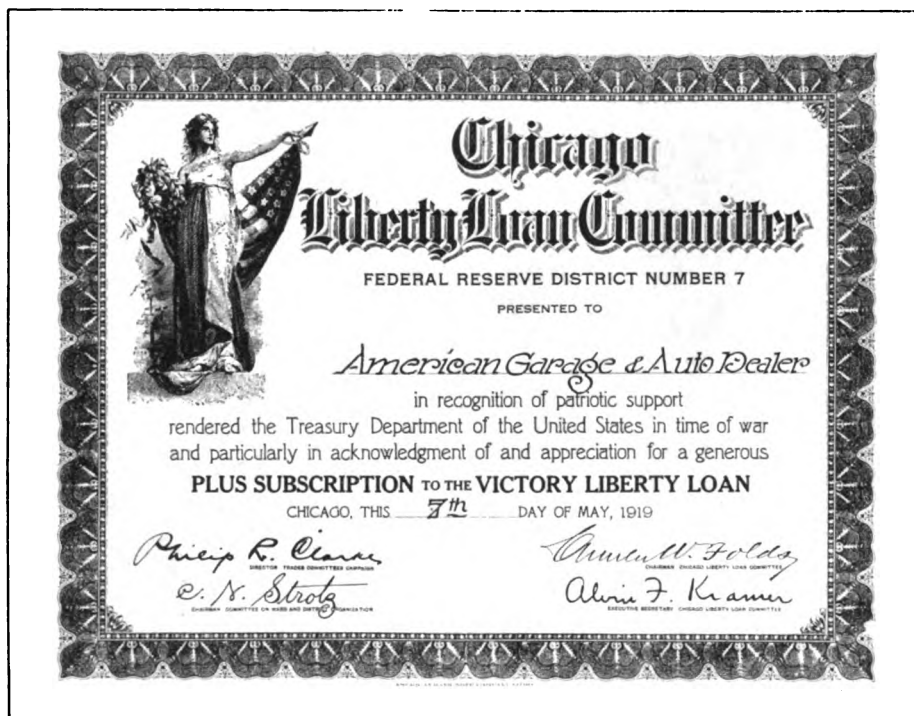
"When I get a car my wife is likely to do as much driving as I will. She'll have to go into that garage fre-

quently, and it is no place for a lady as long as that fellow is around.

"I really think that — is running a first class garage. It looks clean and businesslike. Probably the loose language comes from some young sprout who thinks that because his hands are dirty he has to make his talk correspond. Some people don't mind a moderate amount of cussing. Sometimes it fits the occasion exactly.

"But here is the point with me. Other merchants who get the trade from our house haven't educated my wife up to the kind of language she'll be forced to listen to if we store our car there, so I'm not buying a car now."

EDITORIAL REMARKS



in smaller cities especially say that it is almost impossible to keep their customers away from their repair shops, although they know very well that the customers use up hours of time every month either talking to mechanics about the work they are doing, or arguing with them that they should be doing the work some other way.

One small city dealer who recently adopted an iron clad rule that no customers be allowed in his repair shop did so only when he discovered how much talk and argument there had been in time for which he paid high wages. This man kept careful track for two weeks of the time lost while his three mechanics were stopped in their work by customers who wanted them to leave what they were doing, and go to another part of the place and fix a car, and by other customers who tried to get the mechanics to do

Why Refuse Battery Service Profits?

On another page of this issue there is an article on the advisability of going into the battery service business. The writer calls attention to the fact that average automobile mechanics—good ones, too—look at the battery with awe or with suspicion, but in either mood refuse to have anything to do with it. Men who understand both the construction and operation of batteries, and the design and operation of motor vehicles declare that it is a simpler matter to become a battery expert than for a man to acquire a fair knowledge of motor vehicle mechanics. One of the best reasons why automobile mechanics in small cities and towns should make it their duty to learn how to care for automobile batteries is that they will thus save much valuable time for their customers and friends who otherwise might have to drive miles away to have their batteries attended to. The fixing of batteries and keeping them in proper condition is sure to make money and keep customers for the automotive tradesmen who do it.

their work the way they thought it should be done, which was different from the regular established practice of that particular shop. When he went over his figures at the end of the second week he discovered that each of his three mechanics had been prevented from working for at least 40 minutes each day, and that the total of lost time, for which he paid higher than the union scale, was a little more than 27 hours for two weeks. It may be that this case was worse than others, but the fact remains that the universal enforcement of such a rule would make a pleasant change in the revenue of many small town repair shops. In big cities this rule has been enforced for several years.

Work for a Strong Organization

Very convincing testimony of the need of a numerically strong and active association of dealers is furnished by some proposed legislation regarding the sale of tractors. One state legislature has already acted upon a measure which the National Association of Automobile Dealers has declared its intention of testing in the courts. Unless the members of the retail automotive trade join the big national organization of tradesmen at once and take an energetic part in fighting for their rights as merchants those in a number of the middle western states are more than likely to do their repenting when too late. The national body and its affiliated organizations in the different states must be able to present a united front, both for the purpose of making successful battles against proposed repressive laws and to work for the betterment of the highways, as well as the proper maintenance of good roads after they are constructed.

Keep Customers Out of Repair Shop

"Keep your customers out of your repair shop" is a rule that should be adopted by every automotive tradesman who has any sort of a repair department. The rule is just as necessary whether the repair shop is one where cars, trucks, tractors, or tires are fixed. Numbers of dealers have informed us that their inability, whether real or imagined, to enforce this rule is responsible for their running their repair shop departments at a loss or on a very small margin of profit. Tradesmen located

Install a Curtis Air Compressor



The Curtis Sign

Illustrated above—is 10x14 inches—baked enamel on steel. Cannot be bought, but is furnished FREE with every CURTIS Garage Air Compressor—and cannot be had in any other way.

Display a CURTIS "FREE AIR" SIGN above your door—it inspires confidence and will help build your business. Motorists are looking for this familiar CURTIS slogan—because they know oil rots tires—and that a CURTIS Air Compressor furnishes AIR FREE FROM OIL, which means fewer blowouts, greater tire mileage and less repairs. The CURTIS is the ONLY Garage Air Compressor with the controlled splash oiling system that eliminates all danger of forcing oil into the air line.

CURTIS AIR FREE FROM OIL

Investigate the many exclusive features of CURTIS Garage Air Compressors. The line is complete—five sizes—stationary or portable. Just write your name and address on the margin of this advertisement—tear it out and send it to your jobber, or to us direct, for complete information and prices.

Curtis Pneumatic Machinery Co.
1515 Kienlen Ave., St. Louis, Mo.
Branch Office—530-U Hudson Terminal, New York City




STANDARD MOTOR-PEP

TRADE - MARK

Standard Motor-Pep is a Scientific compound in tablet form that gives you HIGH TEST GAS EFFICIENCY from low test gasoline.

We are so sure that Standard Motor-Pep will be a big seller with you that we are willing to guarantee its sale, as follows:

SPECIAL DEALER'S GUARANTEE

If any dealer, after giving Standard Motor-Pep proper display in their store, does not sell their Initial Order of one dozen boxes within six months of date of purchase, we agree to buy back all unsold packages, that are in good condition, at the rate of \$4.00 per dozen.

You have everything to gain and nothing to lose by handling
Standard Motor-Pep.

Send in Your Order Now

GUARANTEED TO

Save $\frac{1}{8}$ of Fuel Bills Give $\frac{1}{8}$ More Mileage
Give 20% More Power Eliminates Carbon
Gives Quicker and Easier Starting with Consequent Battery Saving
Gives Snappy Pick Up and Perfect Running Motor
OR MONEY REFUNDED

That is what thousands of satisfied customers say of Standard Motor-Pep. Sold with a money-back guarantee.

Send for full size package today, enough to energize 100 gal. of gasoline. 50c postpaid.

Send trial order today for one dozen boxes of Standard Motor-Pep at \$4.00 (\$2.00 profit to you,) and we will send absolutely free 50 samples, 50 testimonial circulars and display card for use among your customers.

Price, 50c Per Box.

Some Good Exclusive Territory Left for Good Live Salesmen

THE UTILITIES CO.

313 CITIZENS BUILDING

CLEVELAND, OHIO

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

ACCESSORIES

By M. E. FABER.

Next to your trade paper, the jobber's salesman who calls on you can be the most profitable asset to your accessory department. Manufacturers have taken a great deal of pains to keep him posted on the selling points of the various lines he carries. You ought to get this information and make it work for you.

Get the selling pointers he has and use them on your own customers. Of course it is possible for you to work these out for yourself, but that is a slow way and what's the use when you can get them ready-made for the asking.

If you handle a certain make of horn, or vulcanizer, or battery, learn why it is the best of its kind. One way to find out how limited your information on any article is, is to try to tell somebody else about it. And when you find out that your information is limited on any of the accessories you handle, ask the salesman what talking points other dealers are using to make the goods move. If he can't tell you, then is the time to begin to wonder why you have that particular line in stock.

There is no profit in goods until they are sold. No merchant wants to see his stock lie on the shelf for weeks or months without moving. If

stock doesn't move as you had anticipated when you bought it, try to find the reason. The chances are ten to one that the fault will not be in the merchandise itself. Possibly your customers don't even know you have it, or if they have happened to see it in your window, they haven't realized that it is something that applies to them at all.

Possibly the fault is with the size of your stock. If you only carry a small stock and are always out of some items, you will find that your customers will soon get out of the habit of asking you for accessories. If your gasoline tank stood empty for a month and all of your customers knew it, how long would it be before you stopped getting calls for gasoline?

Keep Goods in Sight.

Yet there are accessories that are almost as necessary to any motorist as gasoline if you will only let the motorists in your community know it. Keep such goods in stock always and keep them in sight where you and your help will always be reminded to sell them even if a customer doesn't ask for them. A customer who has had the experience of being sold on some item that he had not thought of asking for, cannot help getting the impression that the place where that

experience was obtained is the place to buy the accessories he knows he needs.

Ask your jobber's salesman what items his other dealers are selling and how they do it. You will get honest advice because the salesman wants your trade next year and the year after. Don't wait until he pounds you on the back and forces you to stock something new. You are the one who ought to be most interested in the profits in the live things that are constantly coming on the market and for the good of your business you ought to be constantly on the lookout for accessories that will look good to your customers.

The first, last and only reason for running an accessory department is to make money. Unless you treat your department as a real part of your business and not as a sideline that will take care of itself you are likely to find at the end of the year that it is running at a loss.

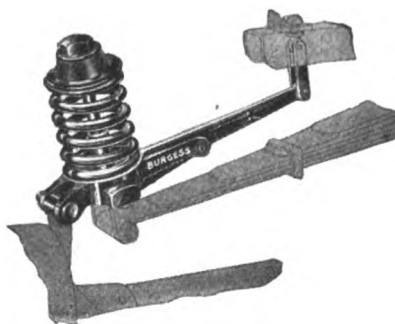
Follow the methods used by successful merchants in other lines. avoid overbuying on any single line, but keep your stock well assorted and if any particular thing seems to be falling behind the others, find out quickly what is the cause, and give it an extra push. You may find that it is really one of the best sellers if it has a fair chance.

QUICK ADJUSTMENT IS A BURGESS FEATURE

Instant adjustment is one of the virtues claimed for the Burgess rebound check shock absorber for Ford cars. A few turns of the adjusting post at the top of the device regulate the spring to the requirement of any load, from that of a light runabout to a heavy sedan body. The big coil spring is made of special vanadium steel so designed that every coil does its share, takes up all the light road shocks, keeps the wheels on the ground and saves the tires, thus prolonging the life of the car.

All of the bearings are friction proof

bushings on hardened steel pins. Leaf springs are shackled to the free acting suspension posts without guideways or other friction and wear producing mech-



anism. The Burgess Company claims that the rubber spring cap is the greatest improvement ever made in a shock absorber, absorbing vibrations faster than they can possibly occur, breaking metal to metal connections between the car body and axle and quieting the entire car.

The rebound is instantly checked by the down pull of the spring arm on the body. The angle and action of the shackle insures the exact degree of side sway provided by the manufacturer of the car. Full details and trade prices can be obtained by writing to the Zinke Co., 1323 South Michigan avenue, Chicago, sales agent for the Walter S. Burgess Mfg. Co.



SATISFY Your Customers by using ORO Connecting Rods

Put Oro Connecting Rods into the Fords you repair. Your customers will come back and send their friends. Hundreds of thousands of Oro Rods are being used with entire satisfaction.

STEEL used in the Oro Connecting Rod is the highest grade open hearth product with a carbon content of 30 to 40 points. There is no connecting rod made stronger than Oro. It will last thousands of miles longer than others.

BABBITT for Oro Rods is scientifically compounded and years of experience have proved it to be the best for this purpose.

WORKMANSHIP on Oro Connecting Rods is the best. The men are the most skillful and experienced in the business. Every tool that has been designed to make the work more accurate is employed.

PROFIT comes in a steadily increasing stream to the garageman who uses this high-grade rod. He builds a bigger and bigger business. He holds his customers. He builds for next year as well as this.

Get Oro Rods from your jobber. Nearly all jobbers have them. If yours has not, write us direct. Be sure to get Oro. Let it build your business as it is building ours.

THE AU-TO COMPRESSOR COMPANY
WILMINGTON, OHIO



Manufacturers of the Oro Line of Auto Parts and Accessories, and of Au-To Air Compressors. During the last ten years we have sold thousands of these Compressors and we have never charged a cent for repairs on any of them.

**The Long-Lived
Connecting Rod
for FORDS**

ACCESSORIES

JEWELL GAUGE DESCRIBED AS BATTERY'S GUARDIAN

The maker of the Jewell battery gauge describes that instrument as "the ever watchful guardian of your battery." This gauge holds the condition of the battery before a car user as plainly as a speedometer tells how fast a car travels.



The Jewell Gauge is described as a permanent and active indicator of the condition of the battery. It does this, not in a technical statement of volts and amperes, but in plain English it quickly warns the driver of the approaching of trouble from any cause. It also notes any discrepancy in the charging current and indicates the existence of a short circuit or insufficient water in the battery. The way the gauge does this can be seen by looking at the illustration. The dial is divided into three zones and the condition of the battery is indicated by the position of the needle in these zones.

Trade prices and full particulars can be obtained by writing to the Jewell Electrical Instrument Co., 1650 Walnut street, Chicago, and mentioning this journal.

Display Stand to Show Lubricating Spring Cover

A display stand for showing the Woodworth lubricating spring covers is being furnished to dealers by the Woodworth Manufacturing Corporation of Niagara Falls. This stand, which we illustrate herewith, has a wooden model of a spring fitted with one of the covers in full size and is adapted to be used in the window, show case or on the counter of the dealer.

The Woodworth lubricating spring cover is a cover made of oil and waterproof material which completely covers the springs. It has a felt wicking on the inside which is saturated with oil before the cover is put on and will hold oil enough to lubricate the spring perfectly



for a year or more. These covers keep out all moisture and dirt, prevent squeaks and make the springs so sensitive that they relieve the tires and machinery of a great deal of strain and prolong their life.

With an investment of only about \$50.00 a dealer can put in a full stock of these covers and be prepared to fit any car on the market, and with the advertising matter which is furnished free he can be sure of some easy and profitable business.

Full details and trade prices can be obtained by writing to the Woodworth Mfg. Corp'n, Niagara Falls, N. Y., and mentioning this journal.

SHORTLESS FORD TIMER SALES ARE INCREASING

While many manufacturers are producing timers for Ford motors in which low price is the prime feature one firm is producing a timer in which the sole idea is quality. The Shortless timer, as its name indicates, is so designated that short circuits and their attendant disastrous results are eliminated.



To begin with the case is Bakelite, a non-conducting fibrous material that is both oil and water proof. The wires enter the case through a flexible metal conduit and all connections are entirely within the case, there being no exposed terminals or wires. The Bakelite case is interchangeable with the regular Ford case and unless the rollers and carriers are badly worn they

need not be replaced or in way interfered with.

A special wear proof fibre ring forms the bearing between the case and the seating ring on the motor. The contact plates are solidly seated in a fibre ring and then ground to perfect face. Lubrication of the roller is provided for by means of a spring top oil cup in the case.

That many Ford car owners appreciate the economy of buying a good timer at a reasonable price rather than constantly buying the cheap timers is shown by the sales already made and the rapidly increasing demand. The Shortless timer is distributed by Gray-Heath Co., 1448 South Michigan avenue, Chicago.

State and Federal Road Plans Make New Records

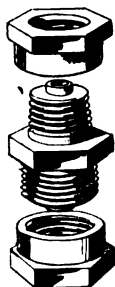
During April, this year, the Secretary of Agriculture approved project statements for 120 Federal aid highway projects, involving the improvement of 923.53 miles of road at a total estimated cost of \$16,261,326.51, and on which Federal aid in the amount of \$7,528,550.68 was requested. This represents the largest number of project statements approved, the largest total estimated cost, and the greatest amount of Federal aid requested during any month since the passage of the Federal Aid Road Act. March of this year had previously surpassed all records in these items.

During April there were executed by the Secretary and the several State highway departments fifty-five project agreements involving the improvement of 521.51 miles of road at a total estimated cost of \$4,626,415.48, and on which \$2,039,614.90 Federal aid was requested and set aside in the Treasury. In addition, agreements to cover seventy-two other projects were placed in process of execution during the month.

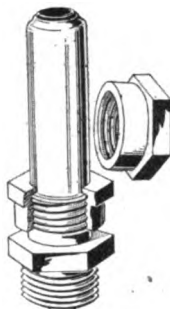
Up to and including April 30, 1919, project statements for a total of 1,057 projects had been approved, after deducting all approved projects cancelled or withdrawn by State highway departments. The 1,057 projects involved 10,580.17 miles of road, a total estimated cost of \$92,933,121.81, and a total of \$36,576,857.48 Federal aid. On the same date a total of 535 project agreements had been executed, involving 4,624.83 miles of road, a total estimated cost of \$39,059,327.44, and a total of \$15,614,929.61 Federal aid.

Is Your Motor Hitting Right?

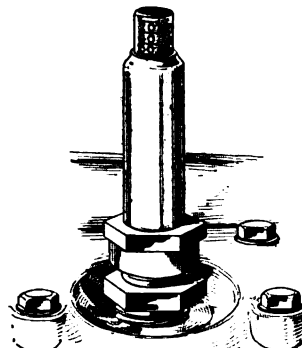
The first essential of motor efficiency is even compression, and you never know till you try it. The Universal Compression Tester enables you to make a correct compression test by means of your tire gauge.



Here it is. One end threaded for $\frac{1}{2}$ " standard; the other for $\frac{3}{8}$ "-18 Plugs.



Assemble it like this, using the end that does not fit your spark plug hole as a coupling to hold the tire gauge.

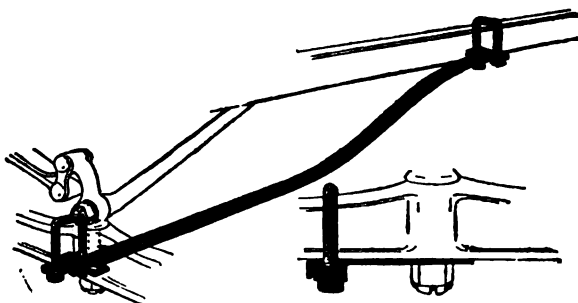


Then screw it in, in place of the spark plug and turn the motor over quickly by hand or the starter, and the tire gauge will tell the story.

One or the other of the threaded ends will fit every American motor in cars, trucks or tractors and either end will clamp the standard Schrader Tire Gauge.

A boon to the car owner and a gold mine for the dealer.

Sturdy Steel Radius Rod for Ford Cars



The first and only Radius Rod for Ford Cars that puts the strain where it belongs, on the frame.

Takes all the strain off the crank case and steadies the steering.

Attached in a few minutes without cutting, drilling or fitting and positively unbreakable.

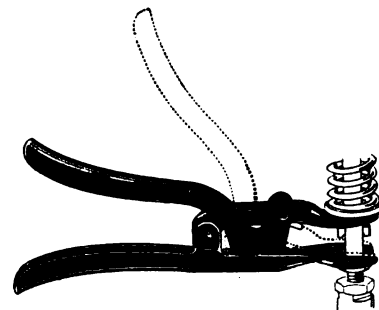
Thousands of Ford car owners have met the loss of money and time and incurred danger and inconvenience through the breaking of the ordinary triangular radius rod, none of which would happen to a car equipped with the Sturdy Steel Radius Rod. Price per pair, \$6.00.

A Real Valve-Lifter At Last.

Here is a Convenient, Dependable and Efficient Valve Lifter, Strong and Durable enough for shop use and cheap enough for the car owner.

A grip of the hand raises the valve spring and automatically locks it in that position.

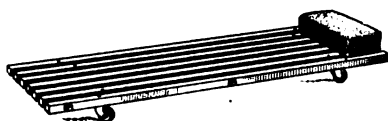
A quick seller for the dealer and a constant satisfaction to the user. Price each \$0.75.



The G.-H. Creeper

Built for the man who wants a serviceable creeper that will not break down, is low enough for him to slide under a car and the right width to work in comfort.

No nails used. The cradle is made of slats 40" x $\frac{3}{4}$ " x $1\frac{1}{4}$ ", all parts securely bolted together. Ball bearing casters. Padded head rest. Price each, \$2.00.



Gray-Heath Service

means careful attention backed by an enormous stock that permits immediate delivery on all orders regardless of volume.

If you don't know Gray-Heath Service by actual experience we both lose.

GRAY-HEATH COMPANY

1448 MICHIGAN AVENUE, CHICAGO

Readers' Questions Answered

Charging Equipment

Question:—Will you be kind enough to publish in the next issue of American Garage and Auto Dealer the necessary steps to be taken to install a charging equipment in my garage?—G. K. A., Superior, Wis.

Answer:—It is not a difficult matter for a good electrician to successfully install a charging outfit, and this can be done in a short time and at very little expense. Thirty lamp sockets should be mounted on a board and wired to snap switches in groups of two, four, eight and sixteen lamps. The necessary items to complete the outfit are a suitable main switch, ammeter, fuse cutout and terminal block.

The wiring should be installed in such a position as to permit the batteries to be connected up and charged where they stand on the bench. Connect in series from one to twelve 3-cell batteries, the positive terminal of one connected to the negative terminal of the next, and so on, and charge at one time.

The current passing through the battery can be regulated to the proper value as the lamps are connected in series with the battery. Different combinations of the switches will permit current to pass through two, four, six, eight and so on up to all thirty lamps, and then through the batteries in series with them.

* *

Fitting Piston Rings

Question:—I have observed different mechanics using various methods of fitting piston rings, and would thank you to publish in detail a method such as you can best recommend.—J. C. M., Lincoln, Neb.

Answer:—A great deal of the trouble caused by oil leaking past the piston rings is due to rings improperly fitted more than to the rings themselves, and the fact should be remembered that a piston ring of good design, if poorly fitted, is as bad as a poor ring.

After removing the cylinder block, and the piston from the connecting rods, the end clearance of the new ring should be fixed by placing the ring inside the cylinder and measuring the clearance at the ends. This may be anywhere from .007 to .0015, as it will vary in different engines, and the exact figure should be procured from the manufacturer or dealer. If the clearance is not enough, file the ring ends with a fine file.

The next step should be to prepare the piston for the rings, and bear in mind that the grooves must be true as well as clean; if the grooves are of one width in one place and another a few inches away

it will be impossible to fit the rings correctly; they must be true in width and depth all the way around, and this requires accurate measurement. The grooves may be filed to make them true, or better yet, use a regrooving tool, thus doing away with uncertainty and trouble.

The rings should now be taken one at a time and fitted into their respective grooves, working from the bottom to the top of the piston. Take hold of a ring and place its back end in the groove and roll it around, which will enable you to determine whether the ring will go into the groove. It may be either too wide to go into the groove, so loose that play is felt, or just right. While the latter is the best, a ring too wide can easily be lapped down to the right width by rubbing the ring over emery cloth or emory dust and oil.

The abrasive material is placed on a level plate and the ring carried over it with one hand, or a block of wood may be used. Lap only a little at a time, and after each lapping clean the ring carefully in gasoline, dry it and try it in the groove again, backward, as before. If rolled around with much difficulty it may be slipped over the piston into its groove for another test.

* *

Graphite Lubrication

Question:—Would you advise the use of graphite lubrication for the improvement of compression? If so, kindly publish how it should be used.—A. C. N., Indiana.

Answer:—While some prejudice has existed against graphite lubrication, we are convinced that flake motor graphite, when mixed with cylinder lubricating oil, and properly used, will not only improve compression, but decrease the amount of oil required, fill up scores in the cylinder walls, and by preventing valves and rings from sticking, will correct a smoky exhaust.

A few years ago when automobiles were not so generally used motorists very frequently would procure from a hardware store for use in their motor cars a grade of flake graphite intended for the lubrication of steam cylinders and other heavy work, then would use many times too great an amount, thereby causing trouble which has since resulted in a certain amount of prejudice. We would suggest different methods of using flake graphite, according to the oiling system in use.

For instance, for a splash oiling system we would recommend the adding of a scant teaspoonful of motor graphite to each quart of oil in the crankcase, then add another teaspoonful at the end of each thousand miles. This may seem a small

amount of graphite, but is all that will be required.

In a force feed oiling system we would advise that no graphite be mixed with the oil as it is possible some of the small passageways may become clogged. A small amount of graphite may be placed in the palm of the hand and allowed to be inhaled through the intake of the carburetor directly to the cylinders. In ordinary service this should be done about once a week. When used in the dry form a greater amount of graphite can be used, as a portion of it is immediately blown out through the exhaust.

We would warn against the use of graphite in the crankcase or transmission case of Ford cars, however, owing to the position of the magneto which makes possible a short circuit.

* *

Repairman's Duties

Question: I have had some experience in mechanics and am about to open a garage and would like any information you can give to help me in starting a repair business, necessary qualifications, etc. Will you kindly publish an answer in your next issue?

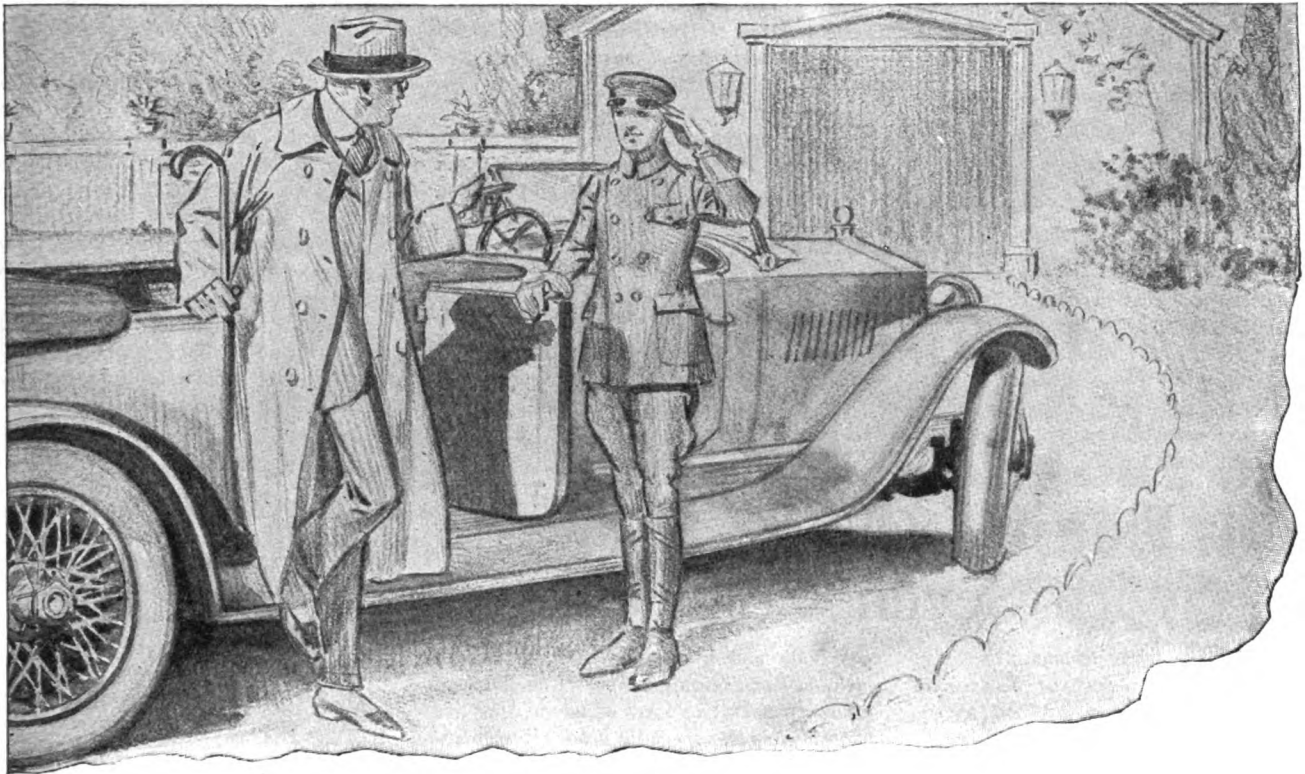
A. L. M., Jackson, Miss.

Answer: The automobile repairman should have a thorough knowledge of the construction of the parts of a car, and must know when and where to look for trouble. He must know how to adjust any part of a car, for one-half of his business will be along this line, such as carburetor adjustment, cleaning carbon, grinding valves, fitting horns, fixing muffler cutouts, diagnosing troubles and many other details. All of these do not necessarily require a thoroughly equipped machine shop, but do require a good assortment of tools, and a knowledge of the construction of a car.

It is possible for you to have any machine work, that may come into your garage, done by a regular machine shop which is properly equipped for such work. In other words, a machinist and a repairman follow two different trades, and we are explaining only the work expected of the average repairman.

Remember that system and order should be maintained; don't throw nuts or bolts on the floor—place them in a box or pan. An evidence of carelessness about the garage will give the customer the impression that the workman will also be careless in the repair of his car, and it is the careful workman who is greatly in demand.

In order to qualify as an automobile mechanic it is necessary to be thoroughly capable to handle the many steps required in overhauling a car, such as: Cleaning




***“Now remember, the only polish
I want used on this car is***

Waxit

“The Perfect Polish”

The owners of the finest cars use Waxit with the utmost confidence—for it is the polish which the most careful housewives have been using on their pianos and mahogany furniture for years.

Waxit is a cleaner and polish combined. Moisten a cheese cloth—rub lightly and presto! Grease, dirt, water spots and streaks disappear like magic, and a mirror-like polish appears.

Mars and surface scratches are covered. Checking is prevented. It keeps the finish *looking* new. Waxit is wonderful. Everybody who tries it says so. You will say so, too. 

WAXIT SELLS AND REPEATS—BECAUSE CAR OWNERS FEEL SAFE IN USING IT.

It benefits the finish, makes it live and elastic. Keeps the car new looking. Nothing else equals Waxit for quick results, for brilliancy of finish, for giving the kind of satisfaction that means REPEATS.

Write for full sized package and our liberal dealers' proposition. Mail the coupon.

WAXIT MANUFACTURING CO.
1539 Plymouth Bldg., Minneapolis, Minn.

Eastern Canadian Distributors,
Walkerville Hardware Co., Ltd., Walkerville, Ont.

Checking is prevented. It's wonderful. Everybody who

—BECAUSE CAR USING IT.

elastic. Keeps Waxit for quick the kind of

1 deal-

WAXIT MFG. CO., 1539 Plymouth Bldg., Minneapolis, Minn.

Kindly send me full sized bottle of Waxit and your dealer's proposition.

Name Address City State

Name
Address
City
State

City _____ State _____

State

the engine—outside with gasolene and inside with kerosene, drip pan, clean and pack pump, clean spark plugs and gasolene strainer, oil magneto, generator, starter, fan, etc.; clean car; lubricate car; inspect and adjust all nuts, gasolene line and tighten all joints, water connections, tires, steering device, springs and fenders, rear wheels, differential (if noisy, take up lost motion), brakes, and spring clips.

Inspect engine and its parts; water hose, gaskets, bolts and nuts holding cylinder to crankcase, generator adjustment, nuts holding exhaust and inlet manifold, air leaks at carburetor, manifolds and spark plugs, cotter pins, muffler, timer or magneto, inspect horn, magneto, switch, generator,

starter, battery and coil connections, and tighten all ground connections. Test compression, clean carbon from cylinders, grind valves, adjust valve clearance, test for knocks, for loose bearings, fit piston rings, clean and adjust spark plug gap, etc.

If you can properly perform all of the above tasks, such as would be only the ordinary day's routine, you should be able to qualify as an automobile mechanic.

* *

Play in Gearset Shaft

Question: I have had considerable difficulty in overcoming an excessive play in the main shaft of the gearset in a car left in my garage to be overhauled, and

would thank you to publish in the American Garage and Auto Dealer a suggestion as to what should be done to remedy such trouble.

E. L. M., Ohio.

Answer: Excessive play in the main shaft of the gearset may cause the gear shift lever to be forced out of position. You will no doubt find that the front bearing on the main shaft is shimmed, so that the trouble you refer to can easily be remedied. End play in this shaft may also be the cause of chattering in the clutch, and a bucking when the car is on a grade, or otherwise pulling hard under a load, and if this is not corrected in time the shaft play may cause permanent injury to the gears.

Spark Plug Men Boost Shows with Seven Color Posters

Among the hundreds of manufacturers of motor cars and motor car accessories who have exhibited their products at the various automotive shows this year, probably none have done more to boost the shows themselves than the Champion Spark Plug Company of Toledo, Ohio.

everybody and everything connected with it would derive some benefit from it.

This co-operative form of advertising has made a big hit, especially among the members of the various automobile associations who were instrumental in promoting the shows. It also appealed strongly to the



The Champion Concern's Show Poster.

This concern has carried out a consistent poster campaign, advertising the automotive show in practically every city in the United States where an exhibition of this kind was held.

The poster used for the occasion was of the 24-sheet variety, specially designed and printed in seven colors. Clear across the top of each sheet, appeared the message, "Visit the Automobile Show" in bold letters, and below, on either side, two large circular spaces—one designating the place of the show, the other the date.

In carrying out this plan of giving publicity to the show, officials of the Champion Spark Plug Company were guided by the old axiom that "nothing succeeds like success. In other words, they figured that if the event proved a big success,

Champion Spark Plug dealers, as it gave them an excellent opportunity to boom their sales of spark plugs by linking up their local advertising with this poster showing.

Are you reaching your proportional part of the customers in your territory? If you are not, what is the reason? If you are reaching more than your proportional part, the chances are you could still further increase the business by attention to the very methods which have already placed you in a position of leadership.

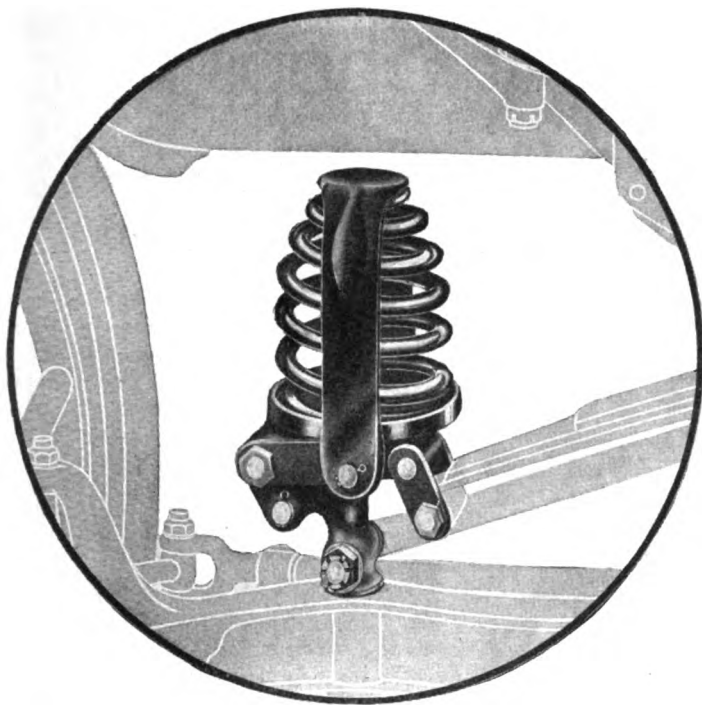
TUBE PATCH FIRM GIVES DEALER A DISPLAY CARD

A very attractive window or counter display card is furnished to tradesmen who sell its products by the Las-Tik Patch Mfg. Co., Hamilton, Ohio. The Las-Tik tube patch, which is advertised by the maker is a patch that will s-t-r-e-t-c-h, is put up in three sizes, in a round screw top can which can be conveniently carried in any tool kit or door pocket. It comes ready for use with cement and emery cloth.



The Las-Tik concern claims that Las-Tik is the strongest patch made, having a breaking test of 2,600 pounds. It is 3/64 of an inch in thickness which makes the patch the same thickness as the average inner tube. The Las-Tik patch has a backing which is 2/64 of an inch in thickness, with a 1/64 inch adhesive rubber facing. It is a cold patch, no heat or tools being required, and can be used immediately, as the pressure and heat from the casing in action does the work. It can be applied in about five minutes.

Trade prices and literature can be obtained by tradesmen who write to the Las-Tik Patch Mfg. Co., Hamilton, Ohio, and mention this journal.



FRONT VIEW

The only
**SHOCK
 ABSORBER**
 that has ever had
 the capacity to
 take the jolts and
 jars out of
 the light little
FORD

HALLADAY

Direct Suspension Shock Absorber

The tremendous capacity—the lightning action of Halladay “bee hive” springs, takes up all the jolts and jars of heavy going and absorbs the little road vibrations.

Recoil is entirely eliminated by removing that element which causes it.

Greater comfort and real saving in tires, gasoline and wear and tear with the Halladay equipped car.

Accomplishes more in every way, than any other shock absorber ever put on a Ford car.

A postal will bring full particulars.

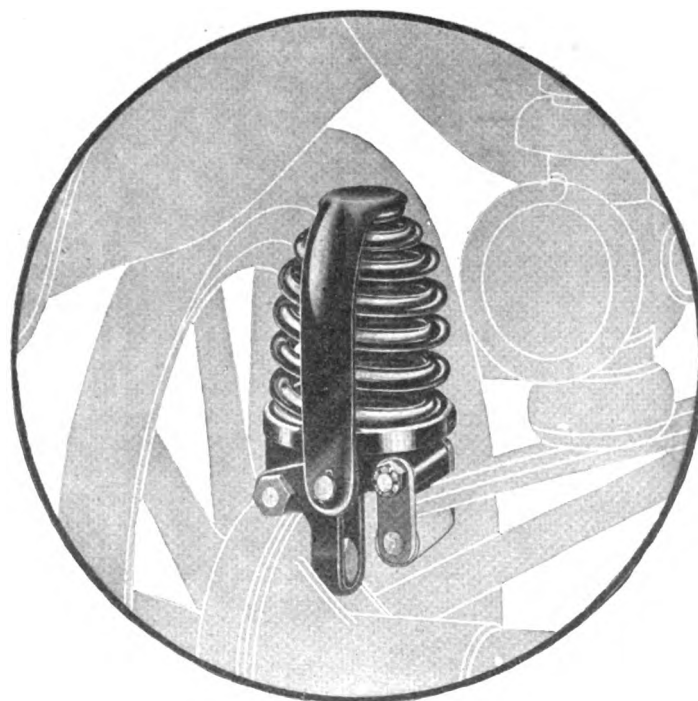
L. P. HALLADAY CO.

Manufacturers of

Bumpers, Shock Absorbers and Automobile Accessories

370-380 Broadway

Streator, Illinois



REAR VIEW

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Practical Hints for Shops

Old Battery Connections.

It is sometimes found that on old batteries the cable terminal slips into the battery connector so far that the cap screw will not draw the connection to a close fit. This will cause high resistance at the connection and at times prevent the starting motor from getting sufficient current from the battery to turn the engine over. To overcome this trouble, wrap lead foil around the cable terminal where it fits into the battery connector, thereby obtaining a tight fit, both electrically and mechanically.

* *

Spring Lubrication.

A very handy tool for the shop for use as a spring cleaner is made from an old brush and a fairly stout stick of wood. The brush should be about five inches long, and a fifteen-inch handle attached to it by means of screws. This tool will be found most convenient for cleaning away mud from the springs, which should be done before attempting to lubricate the spring leaves, as the dirt will prevent oil from working in between.

The job of lubricating the leaves can be effectively carried out by placing two jacks under the frame of the car and lifting the end up, thereby removing the weight of the vehicle from the springs, so that it is an easy matter to work grease and graphite in among the leaves by means of a hacksaw blade or similar thin, flat tool.

* *

Uses of Syphon.

Among many uses to which a syphon may be applied in repairshop work is in drawing distilled water for storage batteries. Extend a glass tube, inserted in a cork, to the bottom of the bottle, and a rubber tube attached to the end of glass outside the cork.

The end of the tube must extend below the bottom of the bottle, consequently it is advisable to place the bottle on a shelf. The tube may be made long enough to reach the storage battery, and the flow of the water controlled by any simple spring device which will pinch the tube. This may be made or purchased at a drug store.

It will be necessary to suck on the tube until it is full of water, which will put the syphon in operation. When this is once done the water will remain in the tube and the syphon will always be ready for use until the bottle is emptied.

The same principle may be applied for drawing gasoline from a tank, oil from a crankcase, electrolyte from a storage battery, and many other uses.

ONE DOLLAR EACH

One dollar will be paid for each shop hint and illustration printed in this department each month. Write out a short description of the time or labor-saving idea and mail it to us with a sketch showing how the idea was used. We will fix up the sketch for reproduction.

Broken Starter Flywheel Teeth.

The breakage of starter flywheel teeth is usually caused by the pinion not being meshed closely enough, and is therefore preventable. Broken teeth frequently occur, however, and the usual correction of the difficulty is to install a new flywheel, thereby involving the layout of considerable expense, and time as well, for it is necessary that the car be laid up to do the job.

One way out of the trouble is to drill and tap a hole in each broken tooth space and thread in a circular peg. Screw the peg in so there can be no possible chance of its coming loose, then file to conform with the shape of the other tooth. The peg must be made of as hard steel as can be filed, as the harder it is the better it will resist wear. As the flywheel gear is usually of cast iron, and the peg is steel, the latter's small bearing surface is made up for by the fact that the material is harder and stronger.

* *

Making a Spring.

To make a spiral spring of a given size, get a bolt of that size and place it in a vise. Be sure that the end of the spring wire is secured to the head of the bolt, and wind the wire in the threads of the bolt. After the desired length of spring is thus made, the bolt can be screwed out of the coil and this can be stretched to the desired length.

* *

Wrench for Pipes.

A Stillson wrench is not needed a great deal around a garage, consequently, when its use is desired for the tightening of a pipe and none is available, the ordinary monkey wrench will serve if used as follows: Place the wrench around the pipe and insert between the jaws a rat-tail file.

* *

Fixing Door Troubles.

It very frequently happens that the doors of one side of the body do not fit properly, either bind so that they are hard to close or fit too loosely and with so much clearance that the catch will not snap. The trouble may be cured by placing wooden wedges under the body at the rear. Metal plates may also be used, but in either case

the wedge should be bolted through the frame so that it will remain firmly in place.

* *

Ford Valve Tool.

A convenient valve tool for grinding Ford valves to be used in an emergency, when the regulation tool is not on hand, can be made from an eight-inch length of broom handle and two nails. Drive the two nails into the sawed-off end of the broom handle until about one inch of the nail is left. Then file off the heads of the nails and bend them until they will fit into the drilled holes in the top of the valve.

* *

Sagging Garage Door.

A very good method of straightening a garage door that has begun to sag, and which we consider far better than the ordinary method of planing off the bottom, is to drive two heavy nails in opposite corners of the door, then run some lengths of heavy wire between them. Slip a couple of blocks of wood under the wire, and then take another spike and use it as a turnbuckle in the center of the wire. This will draw the bottom of the door up, so that it will fit its frame properly. Then drive the turnbuckle spike in the center of the door, and the cure for sagging will be permanent.

* *

Cutting Gaskets.

No doubt every automobile mechanic has had more or less trouble when cutting gaskets from metal and asbestos packing, felt and other materials, or in cutting bolt holes that are especially close to the edge without damaging the material. To avoid this difficulty use two round head hammers, placing the round head of one over the hole and then strike it with the other.

It is also rather hard to cut holes in gaskets without leaving ragged edges. In case you want to make a great many holes of a certain size it is advisable to construct a die consisting of two pieces of metal dowelled together, and with a hole or series of holes through which the dies may be pushed. Slip the gasket material in between the metal plates, and then drive the dies through with a hammer.

* *

Rack for Tools.

A very useful rack for flat tools may be made by boring a number of holes in a board, each hole being just large enough to take the head of a clothespin. Then drive clothespins into the holes and the cleft ends are used to receive the tools. The pins may be made secure by driving a small wire nail through their heads into the board.



When Springs Break put on

VULCAN QUALITY The Replacement Spring

Over 6,000,000 Springs
break each year that
have to be replaced.

VULCAN
AUTOMOBILE SPRINGS
IN STOCK FOR YOUR CAR

Spring Service for a Nation *combines*

- *Quality* Springs for any car.
- *Unlimited* Stocks always on hand.
- Dealers Sales Co-operation.
- Customer Satisfaction.

The result is an established and profitable business
for VULCAN Dealers.

You Should represent VULCAN
FREE Spring Rack to Dealers.

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Jenkins VULCAN Spring Co.
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JENKINS VULCAN SPRING CO. RICHMOND INDIANA

In the Truck and Trailer Field

McKenney Is Western Manager for Denby Motor Truck Firm

The growth of the Denby business in the West and the importance of this great territory has made it necessary to form a more extensive organization for that region, according to an announcement by J. C. Ayers, Vice President of the Denby Motor Truck Co., at Detroit. M. E. McKenney, a veteran of the Denby organization and former factory sales manager, is now established in San Francisco as western manager and will look after Denby affairs west of the Rockies.

Mr. McKenney left for the West soon after the first of the year, and after going over the territory to renew acquaintances, opened offices in the Rialto building at

working in California, Nevada and Arizona. He has been assisting the old dealers and has established a number of new agencies in his territory.

Mr. Ayers also reports that Schnepel and Moore, Denby distributors at Sioux City, Iowa, have been selling many trucks to farmers, particularly for hauling live stock. Actual tests show that in both carrying cattle and hogs to market the motor truck is a money maker.

When cattle and hogs have been hauled to market by horse drawn wagons or by rail, the shrinkage in weight has been considerable, as the animals will not eat while in transit.



J. C. Ayers.

San Francisco. He will direct the work of the organization on the Pacific coast and in the Rocky Mountain states, handling both sales and service affairs and attending to export shipments from Pacific ports.

Assisting Mr. McKenney in the supervision of the territory are J. I. Boldman, who is working among the dealers in the Southwest, and R. J. Moore, who covers the Northwestern states.

The conditions under which trucks must operate in this territory are very severe, because of the mountains, the high altitude and unimproved roads, but the Denbys have proved very popular. One of the most successful newcomers in this region is the Intermountain Denby Truck Co. of Denver. Under the direction of District Manager Monroe this concern has built up a fine business. Another section where the Denby has proved popular, especially the heavy models, is the wheat region of eastern Oregon.

District Manager Boldman is now

Truck Rapid Transit Is Needed for Farm Produce

"The origin of rural motor express lines is obscure, but they have probably been in operation on a small scale and in widely separated neighborhoods for several years," said F. W. Fenn, secretary of the Rural Motor Express Committee of the National Automobile Chamber of Commerce, in a New York address recently, in which he brought out clearly the rapid development and advantages of these systems.

"For many years hucksters have called on farmers, bargained with them for products and sold to the market at a profit. This was bad for the farmer, because the prices he obtained hardly made it worth while to produce; bad for the merchant, because it added little to the prosperity of the farmer and so kept him incapable of becoming the good customer he ought to have been; and bad for the consumer, because the product of the farmers was insufficient and a lot of material came into town that was unfit for food, as for example, the decrepit rooster and the disreputable egg.

"Up to this time it was supposed that railroads carried all the food necessary. We had overlooked the fact that half of our farmers are miles away from a railroad and received so little encouragement that they produced only what they needed for home consumption. It was only when the railroads failed, when embargoes became general, and when the farmer was obliged to waste a great part of what he HAD raised, that our minds turned definitely toward this newer method of transportation.

"The present day rural motor express does six important things. It is:

"A method of getting to market supplies of food hitherto unavailable because of the distance between producer and the market, and lack of other transportation.

"A method of relieving railroads of short and unprofitable hauls.

"A method of encouraging business between farmers and merchants by increasing the earnings of the farmer and improving his purchasing power.

"A method of decreasing dissatisfaction on the part of farmers and farm hands by providing increased facilities and comfort.

"A method of transporting produce to the consumer more quickly and in better condition than ever before.

"A method of maintaining men on the farms and in producing work by others who now spend a great part of their time driving to market."

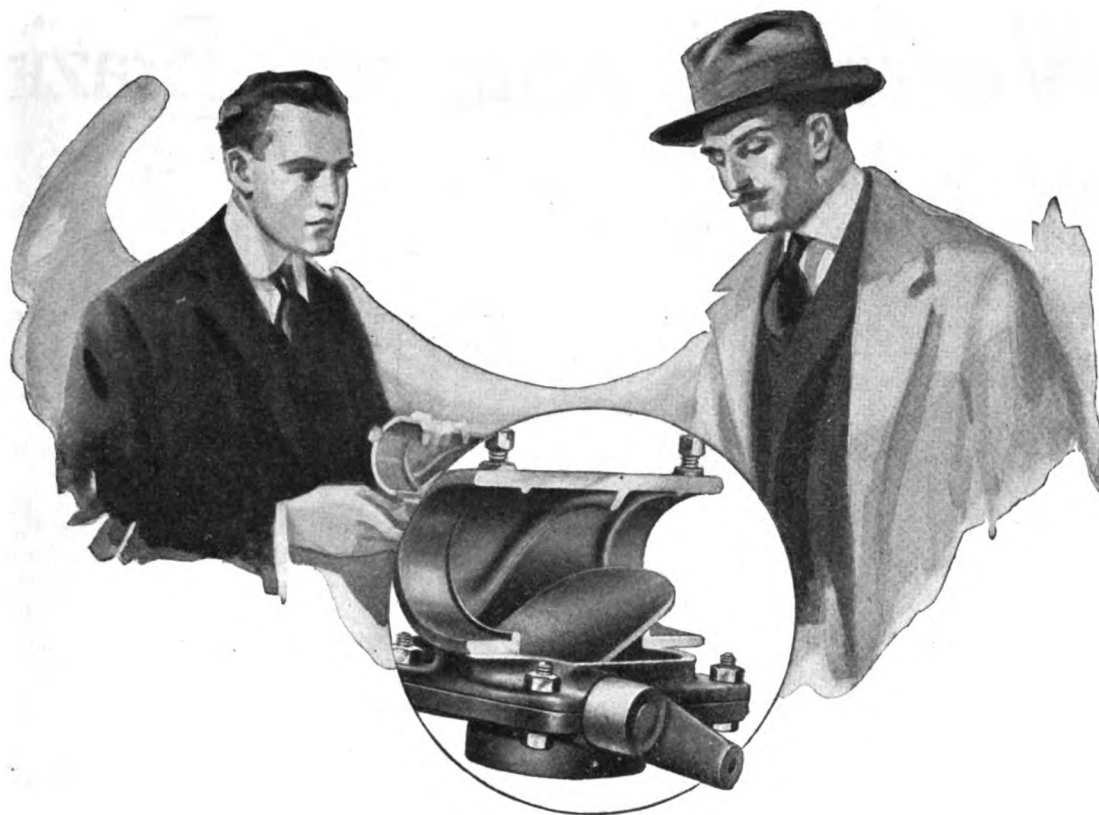
Mr. Fenn's address was given during an eight-day session of the "First Semi-Annual Motor Transportation Conference," conducted by the Colt-Stratton Co., New York dealer for Dodge Brothers, Detroit.

GENERAL COMPRESSOR AND OIL TANK IN UTILITY UNIT

Garages, repair shops and service stations will be interested in the new Utility model air compressor and oil tank in one unit, made by the General Utility Co., 1330 Ogden St., Philadelphia. This machine is designed primarily to lower the cost of free air.



While the motorist is filling up his tires, he sees the neat and handy oil tank, and decides that he might as well purchase oil while filling up his tires. The mounting of the electric motor on the oil tank is such that it conforms with underwriters' requirements. The oil tanks hold 20 gallons each. The General two cylinder air compressor is constructed along the best mechanical principles it is said, producing cool, clean air, at low cost.



“Nip trouble in the bud”

Keep your motor fit

DON'T overlook the little engine troubles. They soon develop into big ones. Know what your engine is doing, and it is easy to keep it fit.

There is one sure way of telling at once whether you are getting the most out of your engine. That is with a G-Piel Cut-Out.

A G-Piel Muffler Cut-Out enables you to tell in a second when you are wasting power,

gas and money. It makes for economy.

When you step on the G-Piel Muffler Cut-Out you literally *blow* the carbon right out of your engine. The exhaust is cleaned and carbon accumulations are forced out of the manifold. It eliminates back pressure.

Sales Department

EDWARD A. CASSIDY CO., Inc.
Madison Ave. at 40th St., New York City
Manufacturers: THE G. PIEL CO., Inc.

The G-Piel Muffler Cut-Out

PIEL PRODUCT

“Tells the motor's secrets”

Welding, Cutting and Brazing

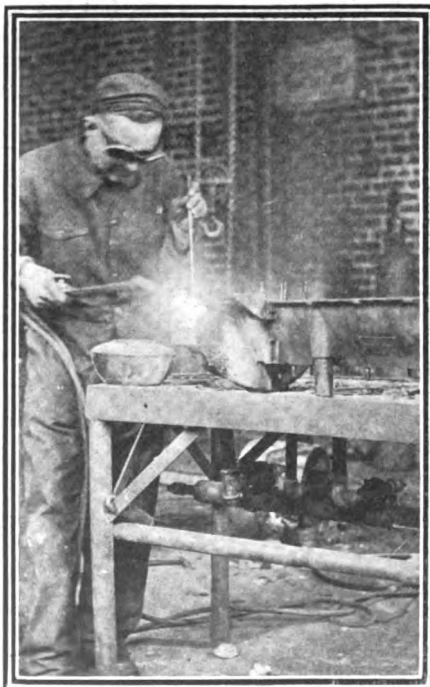
Automobile Welding BY DAVID BAXTER.

Last month's article on welding aluminum crankcases having the fracture located in what I have termed an outside section convinces me, after thinking the matter over, that it will be less confusing if we take a cast iron crankcase with an outside break as the subject this month. Like the case with a broken arm section there are instances where it is unnecessary to preheat cast iron crankcases. In fact, any casting where there is nothing to stand in the way of expansion or contraction. Therefore we will discuss a cast iron crankcase having such fracture instead of proceeding to an aluminum case having an inside, or body, fracture as already planned.

CAST IRON CRANKCASE.

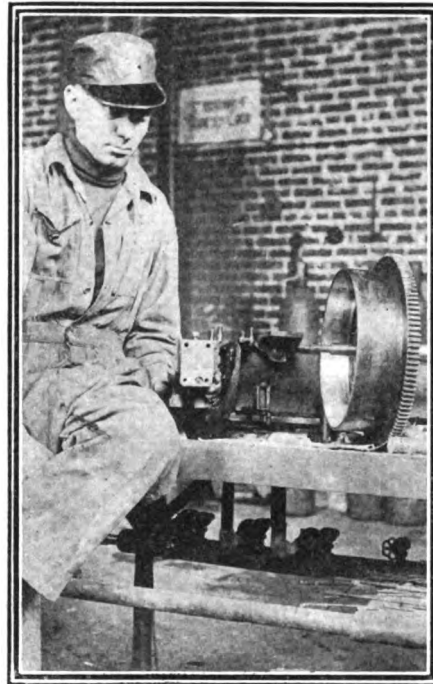
Picture No. 1 shows a torch operator welding an iron case. Notice that there is no covering or other preheating device being employed. This case was welded "cold," which fact cut the welding cost considerably. The flux pot is handily placed on the table directly in front of the operator.

The picture also shows quite clearly the manner of holding the torch and filler rod. Notice that the flame is not pointed directly into the weld, but rather across it. The filler rod is held in such way that it may be bored down into the melted weld to loosen any refractory bit of slag or dirt that may appear in the weld; this position also serves to help in knitting the weld to the bottom of the break.



PICTURE NO. 1.

Picture No. 2 shows the part broken out of the case being held directly in front of its original position in the crank case by the helper. The picture also shows the geared flywheel belonging to this job, which runs in the broken end of the case. Notice that the broken section came from one corner of the flywheel housing. To this is due the fact that the job did not



PICTURE NO. 2.

need preheating; the piece was free to expand two ways, also to contract the same.

A requirement of this sort of welding, however, is exceedingly rapid manipulation of the welding flame. That is, the welding must be done as speedily as possible to prevent a large corner of the crankcase from absorbing much heat, thus augmenting the danger of uneven expansion and contraction. By rapid welding the heat is confined to such an extent there is practically no expansion.

Preparation for Welding.

Almost every welding job requires a certain amount of preparation before applying the flame. In this operation all oil and dirt was cleaned away from near the fracture; the raw edge of the fracture was also cleaned. Then the outer side of the edges of the fracture were chamfered back a distance equal to the thickness of the metal in the fracture. The edges of the loose section were also ground back the same distance, so that when the loose piece was fitted in place the two edges formed a V groove. This groove extended to the full depth of the metal.

Grooving is positively necessary on all cast iron jobs; it enables the operator to

weld clear through the metal and fuse the entire thickness of the weld. If the weld doesn't reach the bottom of the crack it is liable to break over when the least pressure is brought to bear upon the part. Therefore, on all cast iron crankcases like this one, groove the break, then weld to the bottom of the groove.

Another item which should perhaps come under the heading of preparation is that the broken section was held in place with tongs until it had been spot welded in one or two places. Care was taken to see that the section fitted exactly; the least bit out of line meant a defective job.

The spot welds consisted of a drop of filler metal melted to connect each side of the fracture; they held the loose piece firmly in place with no danger of shifting when the case was moved during the welding process. As soon as it was certain the section fitted rightly the operator attacked the main welding.

The Welding.

The weld was commenced at the inner corner of the loose section (the lower right hand corner in picture No. 2) and worked toward the outer edge. Then started again at the same corner and worked toward the other edge. While these two parts were being welded the crankcase was propped up on one side in order that the crack would be in a horizontal position. Horizontal welds are easiest to make on cast iron, this is obvious.

After the first two welds were finished the case was turned upside down while the operator welded a small angular crack in the inside; also a few rough places where the weld melted clear through. Smoothing out these rough places was accomplished by melting them and scraping them off with the filler rod; a file or flat bar of iron is a good tool to use for scraping away the rough parts. While making the last weld and cleaning up the inside of the case it was placed in the position shown in picture No. 1.

Details of Process.

Explained in detail the actual welding operation on the crankcase illustrated was as follows: First a medium size tip was fitted to the torch; the idea being to select the correct flame for the work, not one too large for the metal thickness of one-fourth of an inch, nor yet too small because it would not melt fast enough.

Several three-sixteenth filler rods were selected and placed conveniently on the welding table. These were soft, silicon cast iron. The flame was lighted and regulated in the usual manner to a strictly neutral stage. For welding cast iron of a metal thickness like this job it is very essential to keep the flame strictly neutral.

While getting ready to weld, the cast-

PASCO

THERE'S an air of staunchness, of solidity, about PASCO wire wheels that commands universal admiration. After all, a wire wheel must not only *do* well. It must *look* well. It should enhance the appearance of your car. The correct shade of enamel should—and will—create an attractive contrast to the body-color of your machine.

PASCO finish and coloring are indisputably beautiful. Manufacturers, Dealers, and Owners fully appreciate, too, the PASCO ingenious spoke-lacing—the complete curb-clearance—the indestructible hub-cap—the quick-detachable feature—the safety locking device—the absolute rust-proofing—and the many other distinct PASCO advantages.

Indeed, the full story of PASCO WIRE WHEELS will interest you.

DEALERS: *The PASCO sales-plan is comprehensive. Write for it.*

**NATIONAL WIRE
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| New York | Chicago |
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| IN CANADA: Northern Electric Co., Ltd., Montreal | |

ing, which had previously been prepared as described, was placed on the welding table with the weld upward, blocked in place with fire brick. As soon as the flame was burning properly it was applied to the corner prescribed of the broken section; at the same time the filler rod was placed in connection with the weld.

An inch of the groove was melted, as was also a half inch of the filler. The melting groove and filler were mixed and kneaded together. The flame was moved in tiny circles over the melting section and at intervals played up and down about an inch of the filler to have it prepared for the next inch of the groove.

Use Flux Often.

As soon as the operator was certain the first inch was fused he moved the flame along to the second inch, treating it in the same manner as the first. Most of the time the filler was twisted and churned in the melting weld; at frequent intervals it was employed to apply borax flux powder. This was done by dipping the melting end of the rod in the powder and quickly returning it to the weld. Flux powder adheres quite readily to melting filler.

It is safer to apply flux to all parts of a cast iron weld whether it appears to need it or not. Especially is it necessary if the melting weld appears to foam or show

black cindery specks on the surface. These slaggy spots should be picked out with the filler or flirited out by the pressure of the flame. To accomplish the latter, hold the point of the flame directly over the melting slag then dip it quickly into the melting spot, at the same time flipping it sideways. This usually serves to blow the offending bit out of the weld. If not the filler is used to dig it out.

A good flux causes the slag to float on the surface of the weld where it may be easily wiped away with the filler or a flat piece of iron. At any rate all of the slag should be removed if the weld is to be oil proof, as in crankcase jobs.

To revert again to the welding proper: It was accomplished an inch at a time from one end of the fracture to the other. Each inch was not separate, however, but carefully merged with the previous one. Where it would not interfere with the functions of the casting a surplus was piled up along the fracture to strengthen this part of it. This extra metal was carefully rounded and sloped to lend a pleasing appearance to the finished work. The welder was careful not to melt through to the holes or injure the machined surface of the broken section.

Slow Contraction Assured.

After both directions of the fracture

were welded and rounded the short crack at the top was treated, then the inside as stated. At the conclusion of the welding and hot finishing the end of the casting had become somewhat heated, so it was thought best to set the job aside and cover it with asbestos paper in order to assure a slow even contraction throughout.

This probably was not absolutely necessary, but it is best to err on the side of safety. In this connection it might be well to say, although I have stated that this job was welded without preheating, it is safer for a novice to place about a third of the job over a gas jet or oil burner and get it tolerably hot before applying the torch to prevent any sudden expansion of the metal.

The job being welded and cold it was given a more finished appearance with a sharp chisel and file. Although I have reiterated the statement in the past, I believe it should be repeated again, that the welder will find it pays to make his welds look good by grinding or filing them to remove rough splotchy appearances usually left by the flame. His customers form a better opinion of his ability and of course they will talk, which means a lot of free advertising. Advertising is the life of trade, that old saw about competition to the contrary notwithstanding.

Business Veterans Make Line of Champion Air Compressors

Backed by a strong organization of experienced men, the Champion Pneumatic Machinery Co. has just been incorporated under the laws of Illinois. The concern



H. H. Kouka.

will specialize on the production of a complete line of air compressors of various sizes and will also manufacture a big

variety of air-line accessories and equipment.

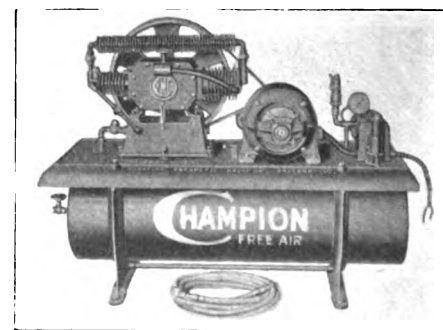
The personnel of the just formed company is comprised of men whose work has made them well known in the automotive industry. The officers are as follows: President, R. H. Green; Vice President, George T. Rayfield; Treasurer, H. H. Kouka; Secretary, Fred J. Rayfield; Engineer, H. O. Meyers.

Messrs. Rayfield are brothers of Charles Rayfield, the carburetor inventor. They have had considerable experience in varied lines of the automotive industry in their years of connection with it and are the inventors of magneto coupling.

Mr. Kouka was until recently sales manager of the Chicago territory for the U. S. Air Compressor Co., and has a wide acquaintance among dealers, garage owners and service station operators. He is said to be one of the best posted men on air compressors in the country. Mr. Meyers was connected with the Chicago Board of Education for a number of years and is well known in the automotive field.

The Champion concern announces that the new Champion garage air compressor illustrated herewith has the following mechanical features: 1, annular ball bearing crankshaft; 2, cylinders and valve heads

cast integral; 3, no joints or gaskets to leak; 4, bronze connecting rod bearing, babbit lined; 5, mushroom tight valves in bronze cages, with special arrangement for grinding valves; 6, removable cylinders; 7, fan blade flywheel; 8, drop forged crankshaft; 9, hollow wrist pin hardened and ground, securely fastened in piston; 10, all parts standard and interchangeable.



New Champion Air Compressor.

The organizers of the Champion Pneumatic Machinery Co. have decided to locate their factory and offices in Chicago in order to have the most convenient location for the automotive trade in the Middle Western states. The general offices are established at 1402 South Michigan avenue, Chicago. Descriptive literature, trade prices and any other information regarding Champion air compressors will be gladly sent to any automotive tradesmen who request it.

Harvey RACINE SPRINGS

Boltless—

Consequently greater strength where strength is most needed.

Accurately heat treated—

Perfectly tempered by the superior patented Harvey Process.

Accurately "fitted"—

There is a specially designed Harvey for every make and model of automobile.

Thoroughly tested—

Every Harvey Spring must measure up to E. J. Harvey's rigid requirements.

—therefore Easy Riding
and
Guaranteed



DEALERS—Write for free Harvey Spring Book containing specifications for over 900 different kinds of springs and other valuable information. Address:

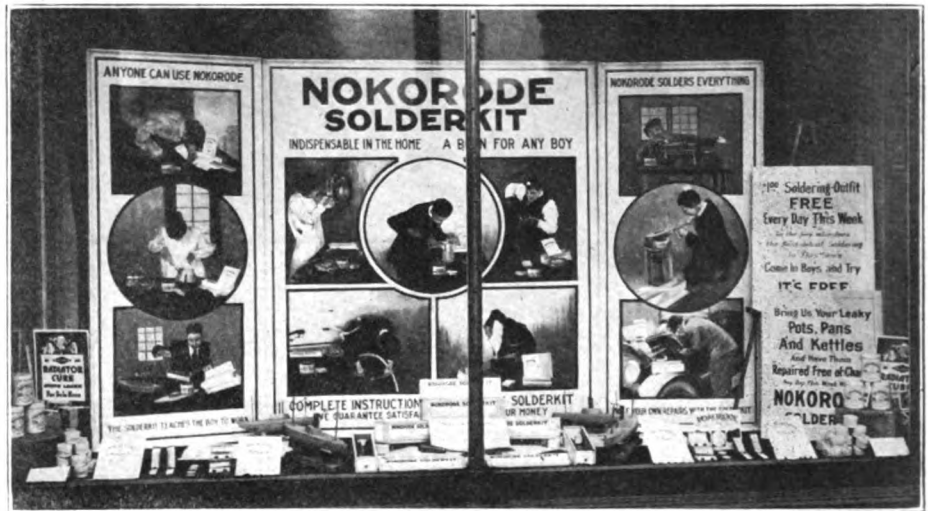
Harvey Spring & Forging Co., 1045 17th St., Racine, Wis.

Installs Profit Winning Display; Total Expense Is Thirty Cents

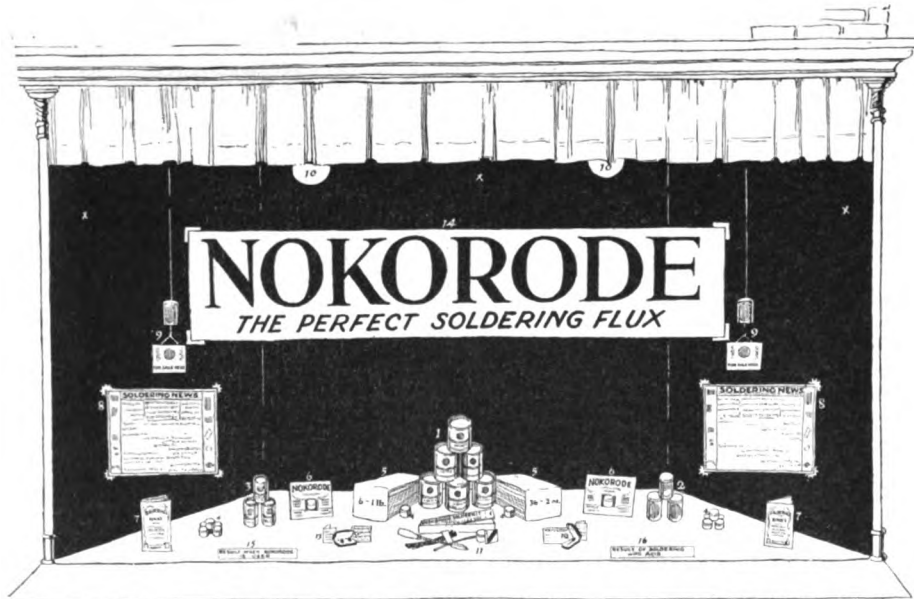
Window dressing should be considered just as important to every tradesman who sells automotive accessories as the kind of goods that will be bought to make up the stock of his establishment.

Stores in great cities and in small towns are benefited by attractive window displays, and this is especially true of stores where automotive equipment is retailed. If the windows are kept bright and clean and the displays changed about once a week, the time and effort necessary will be more than repaid by the profits from increased sales.

One of the pictures on this page shows an attractive display made with Nokorode solderkits. The background of this window, No. 1, shows how the illustrated Nokorode circular picturing the different ways in which Nokorode can be used, was erected as the background for the display.

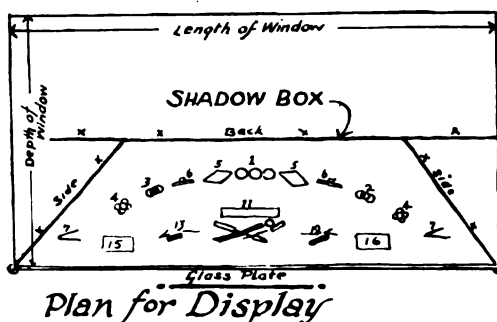


No. 1—Nokorode Window Display.



No. 2—Working Drawing of Display.

Illustration No. 2, is taken from a working drawing of a window display prepared by the M. W. Dunton Co., for the guidance of dealers who wish to make



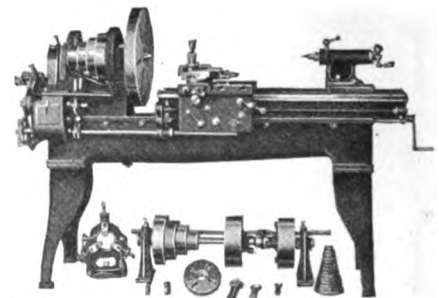
window displays of Nokorode solderkits, and this idea is still further carried out in the small illustration labeled "plan for display." This display consists of No. 1, 6 5-lb. cans of salts; No. 2, 3 1-lb. cans of salts; No. 3, 3 1-lb. cans of paste; No. 4, 12 2-oz. cans of paste; No. 5, 2 cartons; No. 6, 2 counter cards; No. 7, 2 copies of Soldering Kinks; No. 8, 2 copies of Soldering News; No. 9, 2 hanging signs; No. 10, 2-100 watt lamps; No. 11, 1 solderkit; No. 12, 1 prize scarf pin; No. 13, 1 prize cuff links; No. 14, 1 large sign; No. 15, good example of soldering; No. 16, poor example of soldering.

The window is made smaller with a shadow box made of black cambric. The

shadow box is made by hanging cambric across the center of the window, then hanging a piece of cambric at each side from the front of the window to the cambric in the center.

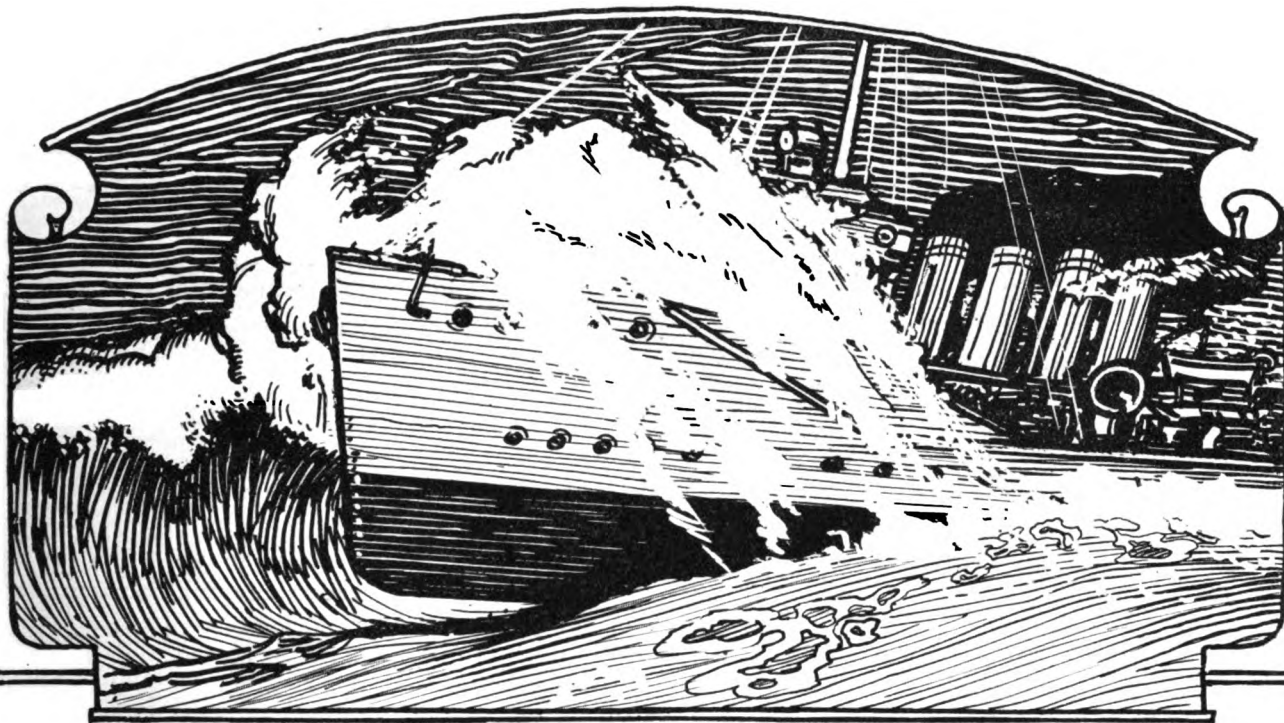
BARNES DRILL CO. LATHE USED IN MANY REPAIR SHOPS

The Barnes Drill Co. declares that its 14-24 inch sliding extension gap lathe is especially well adapted for use in garages and automobile repair shops, and is being used extensively in such places in all parts of the country. It is provided with six quick change geared feeds, and will handle a wide range of work. The spindle is exceptionally large, having 2 5/16 inch diameter in the front bearing with 1 9/16 inch hole through it. All gears are covered with suitable guards.

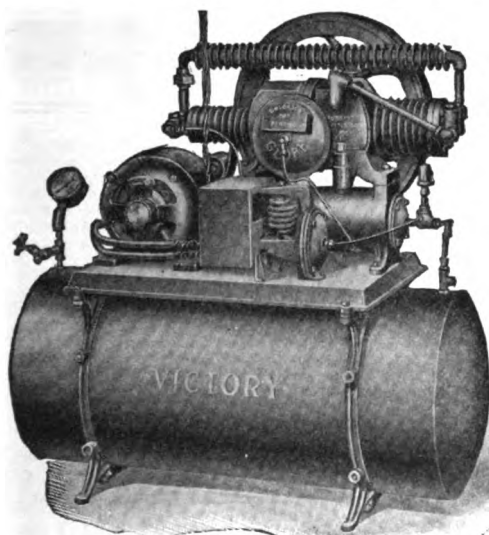


The producer claims that the sliding top bed will be found an indispensable feature for many jobs and especially on general repair work, because it permits a mechanic to swing pieces of larger diameter through the gap and have greater lengths between centers than is possible on an ordinary 14-inch lathe. The machine can be furnished with taper attachment at extra cost when so ordered. The lathe is furnished complete with countershaft, compound rest, center rest, one 20-inch diameter face plate, one dog plate, full set of change gears for thread cutting, also two centers finished and ground, one of them hardened, and necessary wrenches.

Trade prices and full particulars can be obtained by writing to the Barnes Drill Co., Rockford, Ill., and mentioning this journal.



***They have made good
under most trying conditions
thats why we call our new air compressor
"THE VICTORY"***

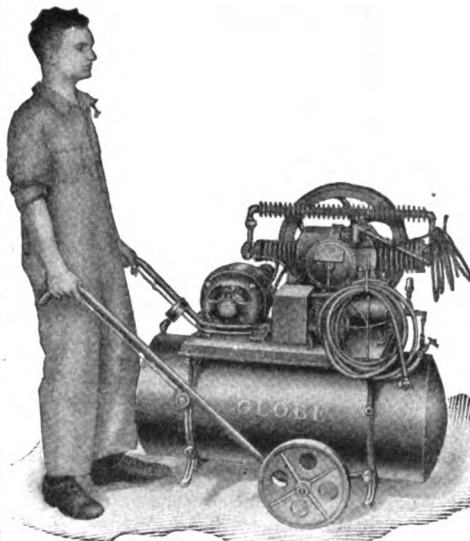


**The "VICTORY" Complete Motor
Drive Compressor Unit**

Constantly alert — on the job every minute — efficient—our new VICTORY Model Air Compressor Equipments are giving the same sort of faithful service as was characterized by U. S. destroyers, and which made success possible.

Experience has shown us that garagemen and repairmen wanted an air compressor embodying the features of the VICTORY—so we proceeded to make it.

Now that many are in use, we are justified in saying that VICTORY air compressor equipments have proved their adaptability for every sort of garage that wants to furnish "Bang up" service to its patrons.



The "VICTORY PORTABLE"
Same as the Victory with Truck Attachment

Let us send you specifications for either our stationery or portable type VICTORY or possibly—you may be interested in some other model of GLOBE air compressor.

LET US MAIL YOU OUR LATEST BULLETIN

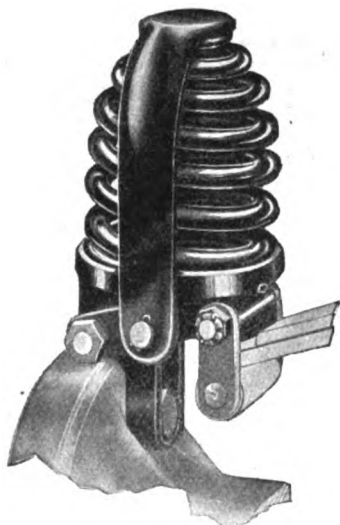
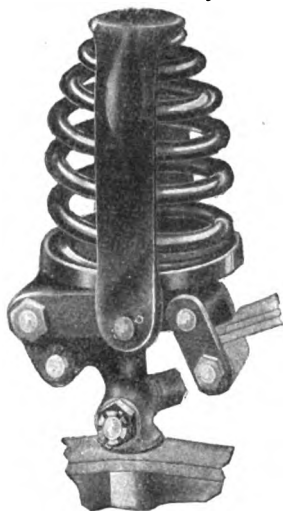
GLOBE MFG. COMPANY
Battle Creek, Michigan

Accessories and Garage Equipment

HALLADAY SHOCK ABSORBER ELIMINATES RECOIL TROUBLES

The L. P. Halladay Company has recently put on the market a new direct suspension shock absorber which eliminates recoil on the principle of removing the cause. Should the axle of the car be sharply jolted up or the body suddenly dropped three inches, the Halladay immediately absorbs more than 2½ inches of the movement, leaving only a fraction of an inch of spring displacement from which the recoil is too slight to be noticed.

When the cause does not exist, there can be no result. The Halladay shock absorber removes the cause by keeping the leaf spring from being noticeably displaced, therefore the rebound never happens.



The great capacity and quick action of the "bee hive" springs, accentuated by the lever

supporting the end of the leaf spring, absorbs all the rapid vibration due to small inequalities of the road. The Halladay is arranged so that it places no strain of any sort on the leaf spring where it can cause bending or breaking.

Other interesting features of Halladay construction are: It directly suspends the car on four sensitive springs; it has no frictional bearings to interfere with the spring action; it has no light, breakable parts or parts to be lost, and it will last the lifetime of the car if ordinary lubrication is given.

The Halladay direct suspension shock absorber is made by a firm which is one of the oldest and largest shock absorber manufacturers in the country, and who positively guarantees it to give satisfaction. Trade prices and full details can be obtained by writing to L. P. Halladay Co., 370 to 380 Broadway, Streator, Ill., and mentioning the AMERICAN GARAGE AND AUTO DEALER.

CROWE FLAT AND V FAN BELTS MADE FOR TRUCKS AND TRACTORS

Announcement is made by the Mechanical Belt Co. that it has recently installed machinery for the production of Crowe flat and V fan belts of the heavy type for use on trucks and tractors. The new products supplement the concern's line of passenger car fan belts. It is prepared to supply dealers with standard size belts packed in individual cartons for the following cars: Buick, Chevrolet, Chandler, Chalmers, Dodge, Ford, Haynes, Hudson, Maxwell, Overland, Oakland, Oldsmobile and Studebaker.

The simple method of disconnecting a link at any desired length makes it easy and convenient for a dealer, garageman or repair shop mechanic to furnish a Crowe fan belt on a moment's notice for any car. The steel chain furnishes strength and durability while the sole leather blocks provide noiseless friction.

Crowe flat and V type belting is covered by a guarantee of 15,000 miles on passenger cars and 10,000 miles in truck and tractor use. An attractive display for counter or show window will be furnished free with each dealer's quantity order. Trade prices and full particulars can be obtained by writing to the Mechanical Belt Co., 2014 Frederick avenue, St. Joseph, Mo., and mentioning the American Garage & Auto Dealer.

FORD OWNERS LIKE EDUCATIONAL ADS ABOUT CORK INSERT

Have you noticed the interesting illustrations in the recent Cork Insert consumer ads? The appeal has been very educational in nature. The driver's foot is shown in contact with the brake pedal. Then the floor of the car is cut away to show the bands, while a peek inside shows just where Cork Insert is used.



—It needs
**CORK
INSERT**

"We know that the Ford owner is impressed with this educational style of advertising," says Miles Smith, in charge of Cork Insert sales and advertising. "Why? Because of the very much larger number of Ford owners who are taking their pens in hand to write for the Cork Insert story. They're mightily interested in better linings for the Ford brake and transmission."

"I wish you would have your readers try this experiment: Have them show Ford owners in need of new lining, three or four kinds. They will, nine times out of ten, choose the highest priced lining. They want the best they can get, because they realize

that it means a smoother, better working Ford."

Cork Insert transmission-brake linings are manufactured by Advance Automobile Accessories Corp., 56 East Randolph St., Chicago.

NEW H-B CHARGING OUTFIT HAS CAPACITIES FOR 16 BATTERIES

The new H-B charger is an ample capacity, money making battery charging outfit, to operate on two, three phase, or direct current, but single phase cannot be furnished in this large outfit. Your lighting company will usually furnish power current.

This outfit is furnished complete with two charging panels, capable of caring for eight 6 V batteries, or their equivalent on each charging line, at the same time. Different voltage batteries can be charged on the same line. Each panel furnished complete, with balancing resistance, coils, and also adjusting resistance for varying charging rates. Panels are equipped with a meter, necessary fuses and switches, and all mounted on a



clear black electrical slate panel. The shipping weight of this motor generator set, complete with panels, is 365 pounds.

The H-B outfit is equipped with ball bearings, which require refilling but once in four months. These bearings insure absolute freedom from bearing trouble, and the utmost economy in operation.

Shipment on the 16 Battery H-B Charger can be made within one week after receipt of order, at the present time. The outfit includes two charging panels, complete motor generator set, and field rheostat, ready to connect to your city lines, and operate. The above delivery guaranteed only for immediate acceptance. Trade prices and full details will be sent to tradesmen who write to Hobart Brothers Company, Troy, Ohio.

NON-EXPLOSIVE GASOLINE CAN MARKETED BY CHICAGO CONCERN

A new non-explosive gasoline can is now on the market and finding favor among garage owners, particularly in the smaller towns where gasoline is sold in cans of small capacity for farm use in tractors, engines or stoves. The can is produced by the Non-Explosive Can Company of Chicago. It is of five gallon capacity and made of steel plate.

The can has an automatic, self-closing cap, which fits tightly over the spout, holding evaporation to a minimum. The automatic cap is equipped with a ring, which when grasped opens the spout when the can is tilted, allowing the liquid to come out. Inside the spout and extending down some distance into the can, is a tube of fine wire gauze and it is to this gauze that the can owes its non-explosive features. The gauze prevents the gas from escaping rapidly when the can is opened and by preventing rapid escape and expansion of the gas, prevents explosion.

The maker declares that a match applied to the spout merely ignites the gas inside the gauze pipe. The flame cannot reach sufficient gas to cause an explosion and the

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....

Name

Address

ROMORT PRODUCTS

The Pioneer Automatic Air Valve still is King of Them All



Style "A" Automatic Air Valve

The ROMORT Automatic Air Valve, Style "A," was the first ever put on the market. Since the first day it has had no equal for free air stations.

It is guaranteed to render the prompt and efficient service that brings the customers back to your garage, and builds business.

ROMORT experience has produced this valve that withstands the roughest usage and abuse.

ROMORT construction is the right construction—the result of "knowing how."

SERVICE is the Basis of a Garage's Success
Make the Efficient ROMORT Service, Your Service

Sold by all "down to date" Jobbers

Factory Sales Representatives
THE ZINKE COMPANY
1323 S. MICHIGAN AVE., CHICAGO, U.S.A.
Manufacturers
ROMORT MFG COMPANY
OAKFIELD, WIS. CHICAGO, ILL.

gas merely burns as long as the stopper is lifted. As soon as it is replaced and the air shut off, the flame is of course, extinguished. It is entirely possible to light the stoppers of two safety cans and pour gasoline through the flame with perfect safety. The can is made of 26 gauge metal, double seamed and soldered. The spout is cast metal and the measure accurate.

LIBERTY SPARK PLUG TO MAKE FORMAL BOW SHORTLY

From Chicago comes a new spark plug that has a reputation of two years' laboratory and road tests behind it. The Casey-Hudson Company, 351 E. Ohio street, of that city, known as an expert machine and tool producer, is sponsor of the Liberty plug. President Casey of the company states:

"The Liberty plug is not a radical plug. We have put one new idea in the plug, because for years there has been a tendency to accept that idea as an adjunct to secure a better, bigger and hotter spark at the firing points. This idea is a spark gap, or intensifier. Our laboratories and repeated road tests have proved that we are right in adding this feature to the plug, also that we have put it where it logically belongs.

"The Liberty spark gap is incorporated in the head of the plug. The binding post and brass head are all of one piece of spun brass. With a specially designed machine we anchor this head to the porcelain. It fits so that a gap of 1/32 of an inch is left between the binding post and the core wire, or center firing points. A breather hole is punched in the brass cap. In this manner the gap, or intensifier, becomes an integral part of the plug. Liberty porcelains are 10 per cent oversize and withstand the most severe heat we have ever put them to."



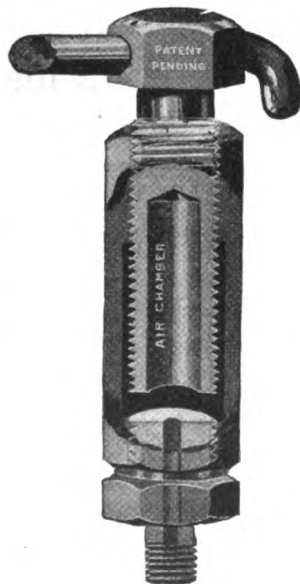
STRICKLER GREASE GUN KEEPS CARS HEALTHY, MAKER CLAIMS

"Keep your car healthy" is the slogan adopted by T. H. Strickler for his high pressure grease and oil gun. He amplifies this assertion by saying, "Lubrication is the life of the car; clogged or dry bearings the death of it."

His gun is designed for use on automobiles, motor trucks, tractors, motor boats, and all machinery where grease guns are used.

Mr Strickler says that his grease gun exerts a pressure of at least 900 pounds at the nozzle and declares it is the only grease gun in existence that will force rust, corrosion and old hard grease out of a clogged bearing and leave it filled with fresh grease. Grease which must be used as a lubricant for steering knuckles, spring supports, and other places on motor vehicles has a tendency to harden when applied through openings in bolts, when of course the grease cup becomes useless. The Strickler grease guns are designed to overcome such conditions, and Mr Strickler tells that after three years of constant use in a large repair shop not a single bearing was found that this gun failed to clean and thoroughly lubricate.

The Strickler high pressure grease and oil gun consists of a hexagon steel barrel chambered internally, and threaded for a heat treated steel plunger which is provided



with an air chamber. The lower end of the hexagon barrel is internally threaded to receive nozzles which are threaded on their outer end to screw into grease cup openings. These nozzles are interchangeable, and are made in standard sizes to fit all standard openings. The grease gun and 17 nozzles can be obtained in a hardwood case. Full particulars and trade prices can be obtained by writing to T. H. Strickler, 4231 Wilcox street, Chicago, and mentioning this journal.

B. & D. PORTABLE ELECTRIC DRILLS HAVE TRIGGER SWITCH

The Black & Decker Mfg. Co., Baltimore, Md., has recently placed on the market two new models: a 3/16-inch and a 1/4-inch portable electric drill with the pistol grip and trigger switch. This patented feature has heretofore been obtainable only in the Black & Decker 3/8-inch, 1/2-inch, 5/8-inch and 3/4-inch sizes.

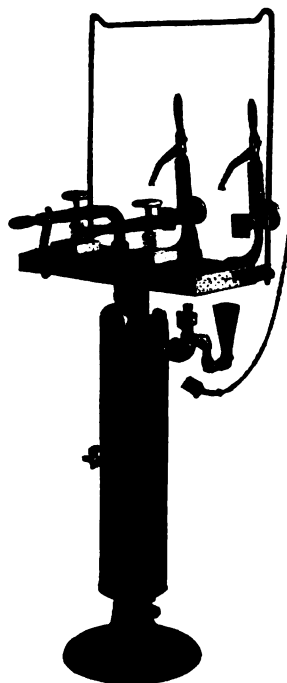
These two models are one-hand drills, which is made possible by the pistol grip and trigger switch. The tool can be handled like an automatic pistol, the current being controlled by pulling the trigger without the necessity for changing the position of the hand holding the drill. In addition to the advantage of convenience, this control saves the breakage of drill bits so often caused by the drill sagging on the bit when the operator changes the position of his hands to switch off the current.



These two models have 1/6 horsepower motors with series compensated windings, and operate on any current from direct to 60 cycle alternating. Cooling is by means of a vane impeller mounted on the armature shaft, which causes a forced circulation of air all through the housing. Gears run in grease in a grease tight compartment like an automobile transmission.

GAUGE CONTROLS TEMPERATURE OF SEPSCO STEAM-ELECTRIC VULCANIZER

In the Sepco steam-electric vulcanizer, made by The Steam-Electric Products Com-



pany, of Cleveland, temperature variation in the plate is controlled within one or two degrees by a simple pressure gauge which opens and closes the electric circuit as the steam pressure rises or falls one pound. A seamless steel tube two inches in diameter is the steam generator. An electric heating coil of special alloy, imbedded in an insulating compound, is wound on the outside of the steel tube and furnishes the heat which makes the steam.

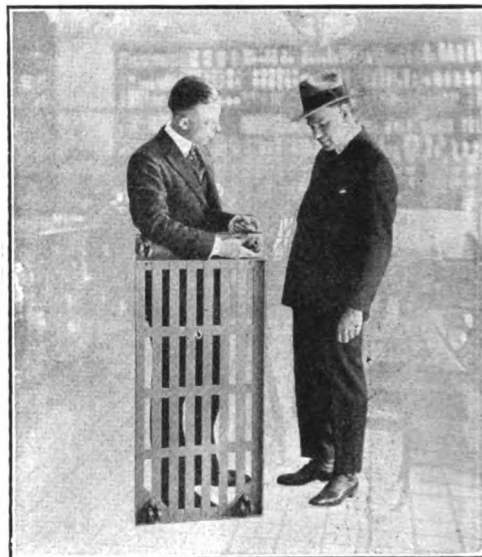
The Sepco tube vulcanizer thus obtains steam heat without using gas, gasoline or other fuel. It can be plugged into any electric light socket and installed anywhere without infringement of fire ordinances. Sixty pounds of steam is obtained in ten to twelve minutes after the current is turned on and after the desired temperature is attained the current flows only half the time.

The Sepco tube vulcanizer is being built now in two sizes, one with four pressure

arms and a plate eight by twenty inches, and one with six pressure arms and a plate eight by thirty inches. Sepco vulcanizers are being distributed by The Binnacle Company, of Cleveland, distributing agent of other Sepco devices, such as celluloid plates, steam-electric glue-pots, etc.

QUALITY IS MAIN IDEA OF CONTINENTAL CREEPER MAKER

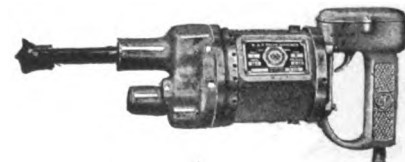
The Continental creeper was designed and made with the idea of quality above everything else. The maker believes that the time of the repair shop mechanic is far too valuable for him to use in fixing broken casters in a cheap creeper. It is claimed that the large double wheel casters will not stick in rough places on the floor. The well padded head rest is covered with oil proof cloth, and can be readily cleaned or removed.



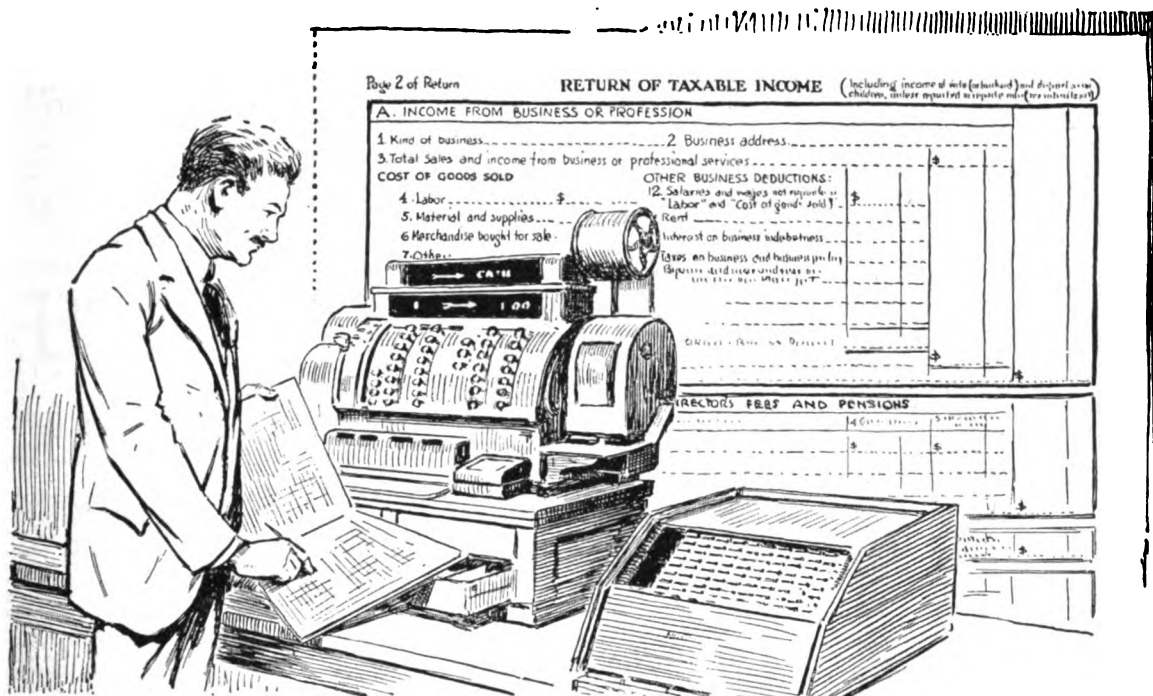
The creeper is big and roomy, 20 inches wide and 44 inches long. Other points of superiority claimed for the Continental creeper includes heavy welded steel frame, and slats made of steel bands that conform to the shape of the body. It is produced by the Continental Auto Parts Co., Knights-town, Ind., and full details and trade prices will be sent to tradesmen who write for them, mentioning this journal.

NEW BLACK & DECKER ELECTRIC VALVE GRINDER.

This is a new tool made by The Black & Decker Mfg. Company, Baltimore, Md., which is of rather unusual design and construction. It is an electric motor driven device with an oscillating spindle, and supplants the old laborious method of valve grinding by hand. The spindle oscillates with a long steady sweep similar to the movement obtained in grinding by hand, but many times more rapidly. The patented Black & Decker Pistol Grip and Trigger Switch is embodied, making it possible to operate and control this grinder in an unusually convenient manner. A 1/6 H. P. air cooled motor is used. It operates on standard power circuits either alternating current with range 25 to 60 cycles or direct current, being made for circuit of 110 volts, 220 volts, and 32 volts.



The motor and gearing with reciprocating mechanism are completely enclosed in an aluminum housing, the gearing and oscillating movement being separated from the motor compartment and packed in grease. The grinding spindle runs in a ball thrust bearing. Armature shaft runs on Norma ball bearings, and gears are mounted on shafts ground to size supported at both ends in long phosphor bronze bushings. Bits are provided to make the tool adaptable to various types of valves.



Every garage man and accessory dealer needs accurate records for two purposes

- ① At the end of each year he needs a complete report of office and service transactions to help make out his Income Tax return.
- ② He needs these same figures every business day. He needs them to control his business.

He needs these figures to know how much money he is making, and what it costs him to do business.

Every garage owner and accessory dealer can get a record of his daily transactions in two ways—the old-fashioned way, by hand, or he can get them by machinery.

A modern National Cash Register makes accurate, unchangeable records. It clas-

sifies, adds, certifies. It saves work and reduces expenses.

No man in the garage or accessory business should keep records by hand that can be kept so easily by a National Cash Register.

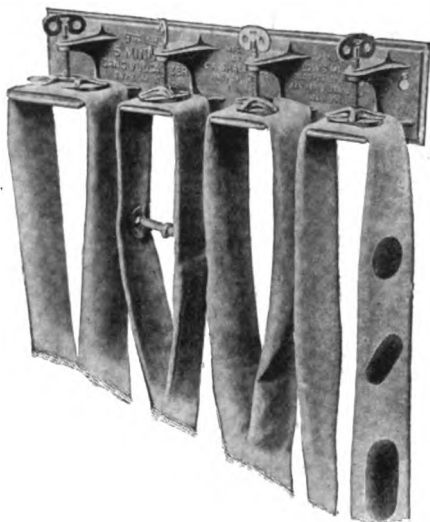
A post card will bring full information about what an up-to-date National will do to help you.

The National Cash Register Company
Dayton, Ohio
Offices in all the principal cities of the world

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Vulcanizer Sells so Fast Maker Enlarges Factory

It is seldom that a manufacturer underestimates the possible demand for his product. C. A. Shaler Co., of Waupun, Wis., manufacturer of tire vulcanizers for motorists and repair shops, is in this unfortunate position. During the war, government requirements for standard mod-



els and the commercial demand caused by the wave of economy that swept over the world, kept the Shaler factory operating at maximum capacity. When the armistice was signed and the needs of the regular customers could once more receive exclusive attention, it was in a better position than ever before to take care of its established trade.

Then, in February, the new 5-minute garage vulcanizer was announced and plans were made for turning out a possible ten thousand of this model during the entire season. Repairmen saw the advantages of rapid and simple vulcanizing and acted so quickly that within three months after the first announcement more than twelve thousand of the new machines were ordered and every customer insisted on immediate shipment.

Speedy steps were taken to increase the output by renting a vacant two-story factory building 40x160 and the Shaler Co. immediately started the construction of an additional factory building of its own. A three-story warehouse, 42x90, is now almost finished, and as soon as it is completed work will be begun on a machine shop of approximately twice that size. The Shaler plant was already the largest factory in the world devoted to the exclusive manufacture of a line of vulcanizers.

A clever merchandising idea, by which the vulcanizer practically costs the purchaser nothing, is largely responsible for the rapid introduction of this device. With each vulcanizer a free gift is made of twenty-eight patch units assorted among the three sizes. If the repair man only gets 25 cents for each of the repairs these will make, he will have taken in \$7, which is the initial cost of the outfit.

LEGAL NOTICE.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912.

of The American Garage & Auto Dealer, published monthly at Chicago, Ill., for April 1, 1919.

State of Illinois, County of Cook, ss.—Before me, a notary public in and for the state and county aforesaid, personally appeared R. B. Johnston, who,

having been duly sworn according to law, deposes and says that he is the editor of The American Garage & Auto Dealer, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher—American Garage & Auto Dealer, Inc., 116 S. Michigan Ave., Chicago, Ill.

Editor—R. B. Johnston, 116 S. Michigan Ave., Chicago, Ill.

Managing Editor—R. B. Johnston, 116 S. Michigan Ave., Chicago, Ill.

Business Manager—J. R. Hastie, 116 S. Michigan Ave., Chicago, Ill.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock): H. D. Fargo, 116 S. Michigan Ave., Chicago; J. R. Hastie, 116 S. Michigan Ave., Chicago; J. C. Kelsey, 1131 Lunt Ave., Chicago; S. R. Edwards, 116 S. Michigan Ave., Chicago; I. B. Lipson, Fort Dearborn Bldg., Chicago; F. X. Mudd, Fisher Bldg., Chicago; E. C. Hole, 431 S. Dearborn St.; S. G. Levy, Fort Dearborn Bldg.; E. T. Clissold, 327 S. La Salle St.; R. S. Clissold, 327 S. La Salle St., Chicago.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state).—None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

R. B. JOHNSTON,

Editor.

Sworn to and subscribed before me this 31st day of March, 1919.

(Seal.)

E. V. CROSS,

(My commission expires Oct. 24, 1920.)

The Handy Thing for Garages

Charging storage batteries is done more easily and in less time when you have

UNIVERSAL BATTERY CLIPS

A quick and ready means of connecting storage batteries for charging. Simply fit your connecting cords with these clips and snap them over the battery terminals.

No. 21-A—lead plated, 1½" spread of jaws. Sample mailed postpaid for 15c in stamps.

Single Lots, Each 20c
Lots of 10, Each 15c
Lots of 100, Each 12½c

R. S. Mueller & Co.
440 High Ave., S. E.,
Cleveland, Ohio



Buy NOW!

Waiting for lower prices before ordering that equipment you need or stocking these accessories your customers want is like sitting on a fence and waiting for your rich uncle to die. You lose more than you can possibly gain by a drop in prices.

To make 1919 your best year buy your requirements NOW.

**AMERICAN GARAGE
& AUTO DEALER**

Price \$4.00

Foster Auto Repair Creeper



Ask for the name of the Foster distributor in your territory.

A FLEXIBLE SPRING FABRIC that gives freedom of action and more actual working room under the car.
A STEEL FRAME that is indestructible.
AN ANCHOR that prevents slipping.
A LONGER SERVICE—making it the cheapest creeper to buy.

FOSTER BROS. MFG. CO., UTICA, N. Y.

Direct Representatives: For the Eastern and Southern States, Auch & Co., 16-24 W. 61st St., New York, N. Y. For the Mid-West: Jessop & Thompson, 1421 S. Michigan Ave., Chicago, Ill. Pacific Coast & Intermountain Territory: McDonald & Linforth, 739 Call Bldg., San Francisco, Cal.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers

BRUNNER

BRUNNER Air Compressors are the creation of careful unhurried workmanship; designed with full appreciation of garage air service requirements. Brunner engineers have studied the garage air service problem from every angle.

As a result the Brunner line of garage air compressors is the most dependable, economical and durable line on the market. And there is in this big line a unit or outfit to meet every service station condition or requirement.

Through the careful selection of materials and the adoption of the highest standards in manufacturing and inspecting, absolute accuracy and the proper strength in every part has been assured so that break downs are unknown and the upkeep cost is next to nothing.

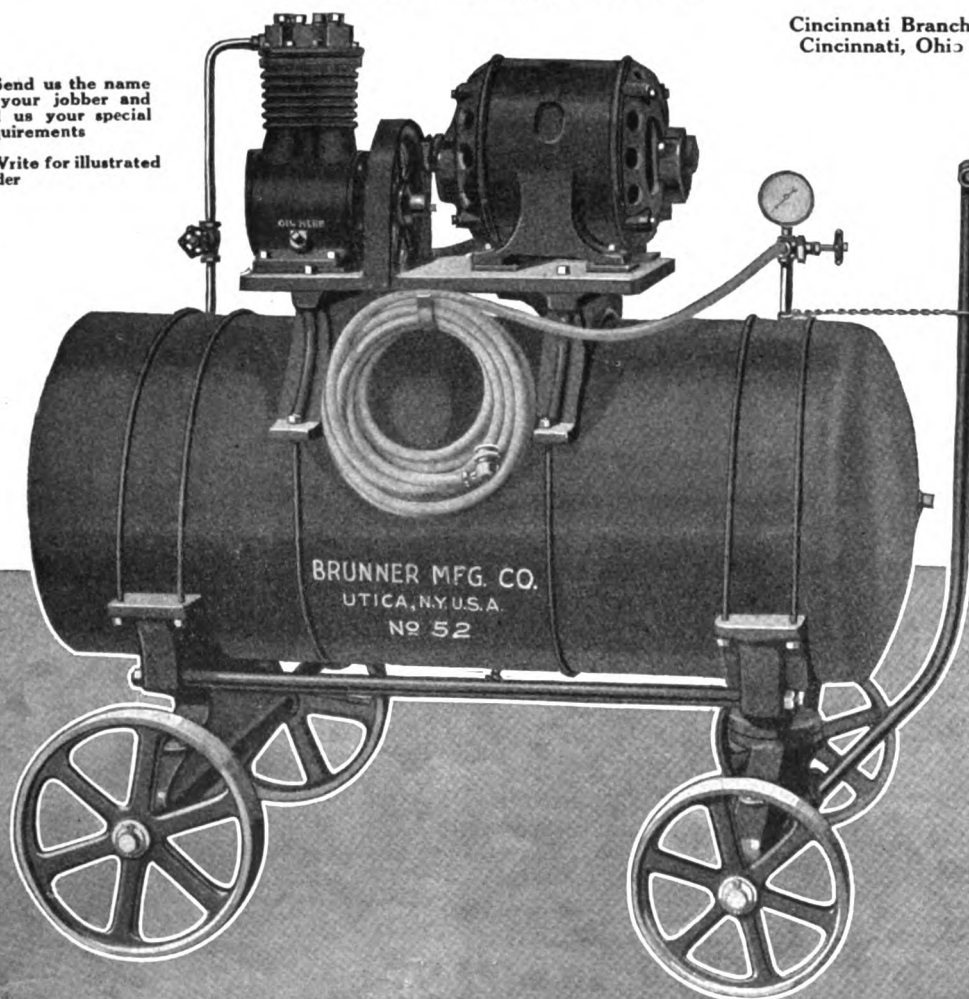
BRUNNER MANUFACTURING COMPANY

Main Office and Factory, UTICA, N. Y.

Cincinnati Branch,
Cincinnati, Ohio

Send us the name
of your jobber and
tell us your special
requirements

Write for illustrated
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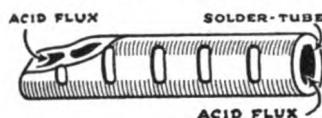


"Take them back"
they know the value of
KESTER
Acid Core Wire Solder

They used it while in the motor transport service in repairing trucks, automobiles and motor cycles. They know by experience its economy and quick service.

The solder is a hollow wire filled with an acid soldering flux, making a self-fluxing wire solder. It will solder any metal except aluminum.

Give it to them now



Sold on 1-, 5-, and 10-lb. spools, or in 1 pound coils.

Order from your jobber or direct

Chicago Solder Co.
CHICAGO - U.S.A.

P.S.—Also mfrs. Kester Rosin-Core Wire Solder



You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

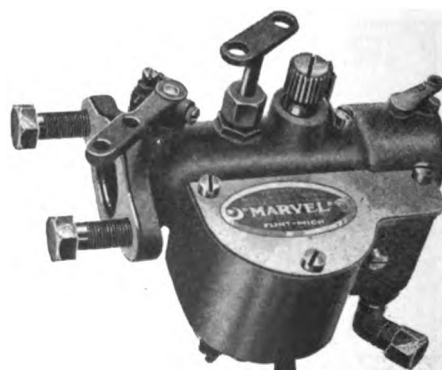
Price F. O. B. Factory \$10.00

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Maxwell, Overland, and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.



DEALERS: Write for the circular "Doing the Work of 3 With 1." It will open your eyes to a source of real profits for you.



BURGESS

PATENTED

**"TRIPLE DUTY"
REBOUND CHECK AND SHOCK ABSORBER
SAVES TIRE AND GASOLINE MONEY**




Here's the Shock Absorber that Ford owners have wanted for a long time—a "Triple Duty" Shock Absorber.

The Burgess accomplishes all that is claimed for three types of Shock Absorbers. It takes up the big bumps, smooths out the little jars and ends all recoil.

There's money for you in this 3-in-1 Shock Absorber that sells for the price of one. *Write us today.*

Manufactured and
Guaranteed by
**WALTER S. BURGESS
MFG. CO.**

Sales Department
THE ZINKE COMPANY
1323 S. Michigan Ave.,
Chicago, Ill.



ROSE TIRE PUMPS

outsell other pumps on the market today.

Correct design, quality, material, and workmanship make the

ROSE


superior to all other pumps.

Seamless steel barrel will not dent.
Solid steel top and base will not break.
Patent valve admits more air to the barrel.
Cupped leather tanned under a secret process.

THE ROSE IS A FIVE YEAR PUMP

| | |
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| Rose Tire Pump 1 1/4" barrel.... | \$3.00 |
| Rose Tire Pump 1 1/2" barrel.... | 3.50 |

*Handled by most jobbers
and dealers.*

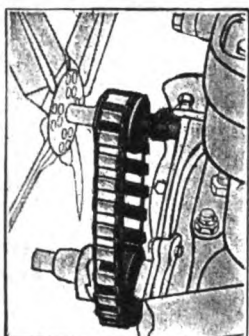


THE
BEST EARTH
THE ROSE
TIRE PUMP
THERE'S REASON
IT'S THE PATENT
VALVE
MORE AIR
LESS WORK
LESS CARE

MFG & GUARANTEED BY
J.H. HANEY & CO
HASTINGS NEB.



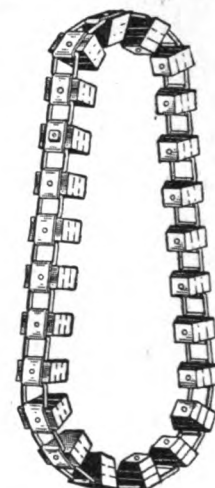
For any type of CAR TRUCK or TRACTOR



If you have never sold CROWE Mechanical Fan Belts—you should! Not only does the simple yet strong design of these fan belts appeal to buyers, but there's "good money" in it for you if you sell them.

CROWE Mechanical Fan Belts are made in a variety of styles—suitable for cars, trucks, or tractors—so that you have many possible sales for them.

Steel wire links produce strength and durability, while sole leather blocks provide noiseless friction. Not affected by heat, oil or water, and will not slip, stretch, or break.



PRICES

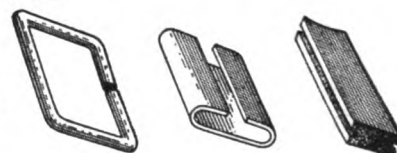
Standard FORD Sizes, adjustable to all models, each....\$1.25
Flat Type, any length or width desired, per foot..... .60
V Type, any length or width desired, per foot..... 1.20

Dealers find our proposition most interesting

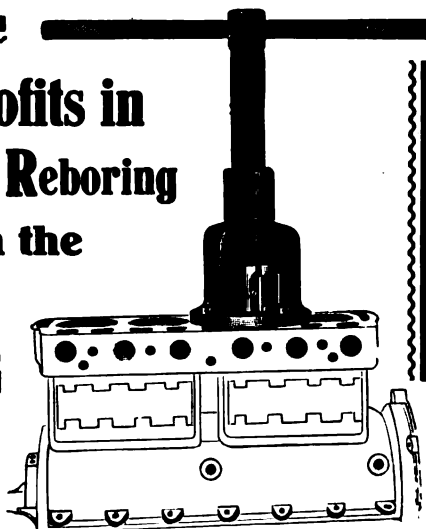


The Mechanical Belt Company

2014 Frederick Avenue, St. Joseph, Mo.



Big Profits in Cylinder Reboring with the DAVIS REBORING JIG and REAMER



You can rebores old Ford cylinders, and by getting new pistons (1-32 inch oversize) you can make an engine as good as new. This is no exaggeration—old cylinders being thoroughly "seasoned out" are actually superior to new ones.

There is a big demand for this class of work among Ford owners and as soon as you are known to have the equipment, you will get your share.

With a Davis Reboring Jig and Reamer, one man can rebores a set of four cylinders in 60 minutes, and do as good a job as the large shops. And you make a good profit.

We also make a milling attachment for drill press.

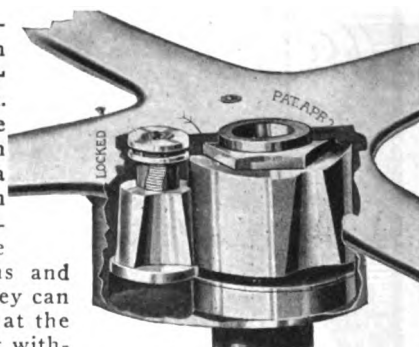
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HINCKLEY MACHINE WORKS, Hinckley, Ill.

"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."



*Approved by the Underwriters' Laboratories,
and affords 15% discount on insurance.*

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

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THE RELIANCE COMPANY

411-417 So. Sangamon St.,

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Distributors in every state

The Usaco Line

Comprises more than 20 different numbers in **Two Stage and Single Stage** Types and various individual equipment adapted for forming combinations of almost unlimited kinds and capacities.

U. S. Air Compressor Co.
Cleveland, Ohio

Please send literature advertised in American Garage and Auto Dealer to address in margin.

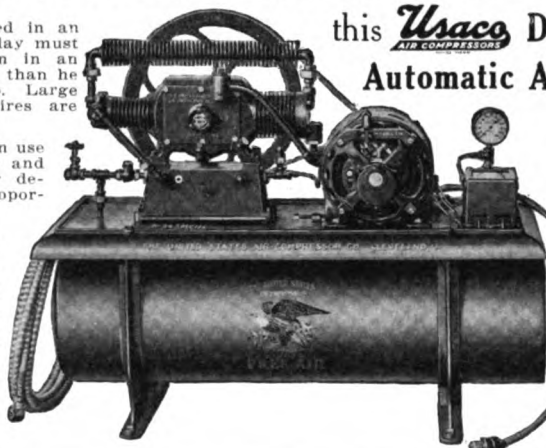
The High Pressure Era is Here—Equip for it with this **Usaco DeLuxe Two-Stage Automatic Air Unit**

THE man interested in an air compressor today must view the situation in an entirely different light than he would a few years ago. Large size, high pressure tires are here to stay.

The number of cars in use is growing with leaps and bounds, with free air demands increasing proportionately.

Tire inflating machinery must not only be capable of delivering higher pressure than ever before, but it must be so constructed as to render a greater measure of more severe service.

The Usaco De Luxe Two Stage Unit, illustrated herein, is such a machine. It has



proved its case in thousands of the better garages and was the air compressor that solved the high pressure problem for the Government during the war. It pays maximum returns on the investment and is the kind of machine that grows in favor the more closely its record and construction is studied. The Usaco Guarantee proves the confidence we have in this unusual machine and stands as an absolute protection to the purchaser.

The
United
States
Air Compressor Co.

6542
Carnegie
Ave.

Cleveland, Ohio

TIP-TOP OF AKRON TIRE-REPAIR OUTFIT

The Best Equipment

It pays to buy the best equipment if starting in the tire repair business or adding to present equipment. Tip-Top Tire-Re-Pair Equipment is regarded by tire manufacturers, tire repair schools and repair shops as representing the highest standard of quality in tire repairing equipment that it is possible to produce.

TIRE RETREADING

The high price of tires has created a big interest in tire retreading. Motorists who have worn down their tires until no longer usable want new treads put on. Every tire repair shop should have one of these recently developed Type E Cavity Retreading Outfits, which operates on the same principle as the regular cavity vulcanizer used for repairing casing punctures and blowouts.

Cost of outfit with self-contained steam boiler is much less than that of a vulcanizing kettle and separate steam boiler. (The use of large and expensive retreading kettle outfits is no longer necessary since the development of this type of retreading equipment—and the elaborate, difficult and time-consuming system of wrapping tire is not required with the cavity method.) Outfit is very compact and takes up little room in the shop.



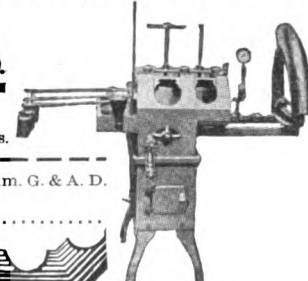
Motorists who have never bothered with tire repairing are now having casing and inner tube punctures and blowouts repaired by the vulcanizing process.

TIRE REPAIRING

Now is the timely time to start in the tire repair business.

We make a complete line of Tire Repairing Equipment—cavity vulcanizers of both the self-contained boiler and separate boiler types—Tube Plates—Steam Boilers—Bead Molds—Tire Repair Tools. No matter what you have need of we are in position to supply it to best advantage.

Write us today for literature describing our full line of tire repair equipment and data regarding vulcanizing and the possibilities for profit in the tire repair business.



THE AKRON RUBBER MOLD & MACHINE CO.

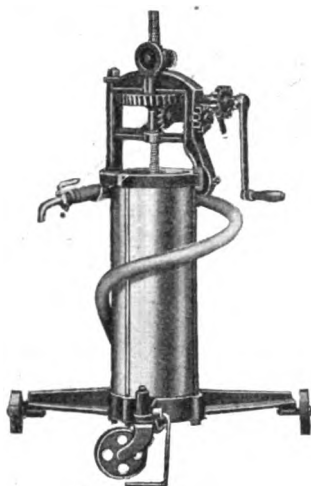
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1059-63 Post St., San Francisco. 1026 So. Los Angeles St., Los Angeles.

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Ekern Portable Garage Grease Gun, Model N.

Business thrives when they're around

People invariably patronize garages which give honest service. If you have either an

EKERN MODEL N or MODEL K PORTABLE GARAGE GREASE GUN, your sales of grease or oil will be publicly registered.

Portable, practical and clean guns.

The EKERN is the only hand operated gun on the market that will work any weight of grease as well as oil.

Model K holds 20 lbs. grease or 2½ gals. oil.
Model N holds 56 lbs. grease or 7 gals. oil.

So that you may become better acquainted with the "money-making" advantages of PARO specialties send for copy of our new booklet.

Your regular jobber can fill your order.

H. G. Paro Co.

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GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company
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No wasted "Free Air"

SNAP! When the inflating valve is removed the AIR PRESSURE STOPS

All garages and repair shops distributing free air can profitably use the

SCHRADER



**UNIVERSAL
INFLATING
VALVE**

If you have a SCHRADER valve you know that your "bottled air" is safely tucked away the minute it is taken off the tire valve. The air is released by pressing the nozzle of the inflating valve against the tire valve, and stopped by removing the device from the tire valve. Fits any diameter of hose from ¼ to ¾ inch. Price, \$1.50.

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Sell readily because their superiority is well known to the Motoring Public

"AM-PÉ-CO" PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. "AM-PÉ-CO" Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes.

We also make the famous "AM-PÉ-CO" WHEEL PULLERS and BRAKE SHOES, both one- and two-piece. If your jobber does not handle "AM-PÉ-CO" Products, write us direct.

F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

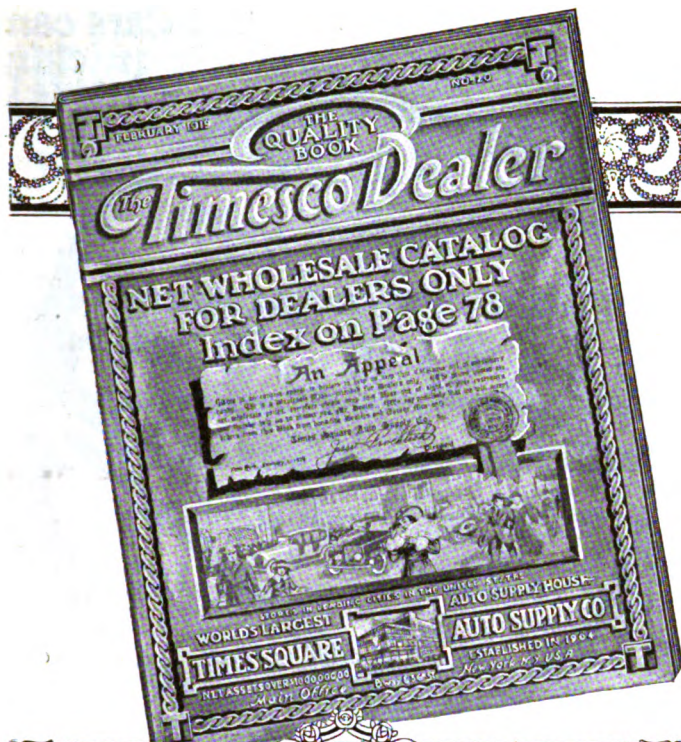
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**American
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Marshalltown,
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TIRE COVERS

Made to best answer the purpose for which tire covers are intended—*service—protection*.

Toughest, most durable of fabrics. Hardiness—and wear that will stand rough usage and worst of weather. Still—Badger Tire Covers have—and retain an appearance of class that harmonizes with the finish and equipment of the most costly cars. Dealers find tremendous demand. Exceedingly liberal profits. Write for particulars—and prices.

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Newest thing in re-covers. Abolish all re-covers—disadvantages. Simple in construction. Absolute fit. Cut by car manufacturer's patterns. Come complete. Put on in few minutes' time—by unskilled labor. Unlimited sales field.

BACK CURTAINS

With Plate Glass Windows

A welcome advancement. Most attractive back curtain that ever graced a car. "Pierce-Arrow" effect. For all cars. Crystal Clear plate glass—instead of unsightly celluloid. Splendid profits. Keen demand.

Send now—for many money making facts on these four leaders in the accessory market.

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CYLINDER RE-BORING PAYS A BIG PROFIT

There is no single class of work you are now doing which will pay you as big a profit as Re-boring Gas Engine Cylinders.

THE MARVEL CYLINDER RE-BORING MACHINE No. 5 is the first and last word for this work.

It not only pays you handsomely—it is an asset—it brings other work to your shop.

Write at once for our proposition—let us show you how we help MARVEL Owners.



Equip your Shop to Re-bore Engine Cylinders and fit with MARCO OVERSIZE PISTONS.



Write today—we have some interesting information



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1307 S. Third Street Minneapolis, Minn.
In Writing Please Use Address in Full—It Expedites Delivery

Disabled Cars can
be towed in quickly
with it!

**HOLMES
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**Robt. Holmes
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This garageman knows he can do good work if he has NOKORODE for his soldering jobs

For all around automobile work there is nothing which excels NOKORODE as a soldering paste.

NOKORODE has "proven its value" in automobile work—used by majority of automobile manufacturers, and by hundreds of garages, repair shops and service stations.

Order a supply and be ready for your next soldering job.

Sample and prices on request

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will pay **\$100.**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrinding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

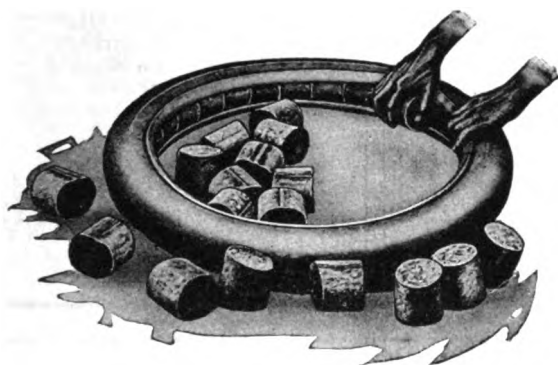
How You Can Conserve with National Rubber Tire Filler

More Miles Per Tire—Less Tires to Buy and
No Buying of Tubes at All.

During the period of the War we learned to
conserve in many ways—Food, Fuel, Farm-
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ties were first. The use of

National Rubber Tire Filler

offers you a medium for continuing to con-
serve without any sacrifice whatever.



Motorists Have No Tire Trouble Who Ride on This Perfect Substitute for Air

Rim-cut-proof, blowout-proof, puncture-proof
tires are now a reality. Motoring is now
freed from the shackles of tire trouble, and is
made safe, comfortable and enjoyable.

National Rubber Tire Filler replaces the inner
tube. It has all the resiliency of an air-filled
tire with none of its disadvantages. It lasts
indefinitely—40,000 miles or more. It has been
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proven its superiority and economy over air-
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proof positive of its great popularity.

It rides as easy as air.
It cannot puncture or blowout.
It can be used on all style tires.
It doubles tire mileage.
It is easily installed.
It stimulates motoring.

National Rubber Filler Company
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BATTERY CHARGING

This big money-making business is open to every live garage man. Wherever cars are driven, there are batteries to be recharged; and now, with all new Forda coming out with storage battery equipment, the opportunity is even greater. **Get in the game, get the big profits that battery charging pays.** No other part of your garage business pays anything like as big profits. With HB Equipment, it costs you only 12c to 15c to charge a battery, and the customer pays 75c to \$1.50. Compare that profit with profits from other lines of your business. Battery charging can be made to pay from \$100 to \$400 a month. The business is at your door—go after it!

An HB Battery Charger for Every Size Business

You can get an HB Charger in any size you need. All HB Chargers are sturdy, dependable and absolutely reliable. Built of finest materials obtainable. Nothing to burn out, no expensive renewals or repairs. Plain, honest, profit-producing service 24 hours a day. No electrical or mechanical knowledge required to install or operate. No attention except occasional oiling. Uses power from any city lines. Big, quick, clean profits, easily made!

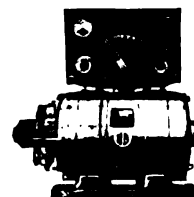
CHOOSE THE SIZE YOU NEED

HB 500 Watt Charger

Recharges 1 to 7 6-volt batteries or their equivalent at a time. Charger is 27 in. long, 26 in. high, weighs 250 lbs. Furnished complete with clear black electrical slate switchboard, with mountings of ammeter, field rheostat, voltage lamp, two controlling switches. A big money-maker for a small battery business.

\$25 Cash

9 Monthly Payments of \$30 each



HB 16-Battery Charger

Recharges 1 to 16 6-volt batteries or equivalent in 12 or 24-volt batteries at once. Motor 1 KW capacity. Operates on 2 or 3 phase current only. Furnished complete with 2 independent charging panels, each with capacity of 8 batteries. A splendid machine for every live, energetic garage owner wishing to get big profits.

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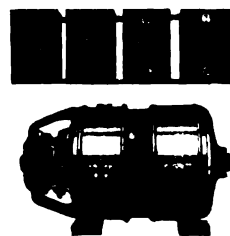
HB 32-Battery Charger

Recharges 1 to 32 6-volt batteries or equivalent at a time. Motor 2 KW capacity. Operates on any current. Four separate charging lines, each capable of charging up to 8 batteries. Permits individual attention to batteries on charge. Ideal equipment for big garage or battery service station. Will make as high as \$250 to \$450 a month Clear Profit.

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**Sold on Trial Under HB
Absolute Money-Back
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All HB Equipment is sold under our absolute guarantee of complete satisfaction. If not satisfied after using any HB Equipment 10 days, you may return it and receive all you paid us. Monthly payment plan is an additional guarantee. Machines pay for themselves out of earnings.

**Select the Charger You Need—Mail First Pay-
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HB Chargers Are the Motor Generator Type

There are many charging appliances on the market which on first impressions look good. Investigate the operating expense and the cost of parts that wear out or burn out, causing endless trouble, worry or needless expense. It should mean something to you that 75% of all HB Motor Generator Chargers sold replace other charging appliances. Remember, it is not first cost that is so important to you as the monthly bill for current, repairs, renewals, etc. Remember you are buying a battery charger for years of hard service. Get an HB Motor Generator Charger and be free from all expense and trouble. Motor Generator Chargers are sturdy, dependable and last for years under hardest usage. If in doubt, write us for full data on various types of battery charger. Buy your Charger for Long Service and Big, Steady Profits. You run no risk with HB Chargers.

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Successful Manufacturers Since 1893

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What To Do With Your Old Tires



Popular Science Monthly is running a contest on this problem. We can tell you the best solution. We "re-make" old tires by a process that gives them

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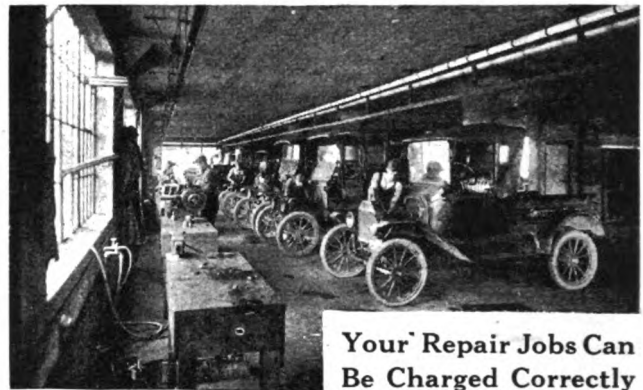
5000 MORE MILES

Even if they are sand-blistered, blown out, punctured or rim-cut, we make them like new. Your customers can get at least 5,000 more miles out of their old tires and you can make a good profit on each job if you will take the trouble to investigate. With new tire prices high, this service will interest every car owner. Write us today.

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804 Commercial Ave.

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Your Repair Jobs Can
Be Charged Correctly

The Calculagraph is a necessary part of the repair department of every up-to-date Garage.

With the CALCULAGRAPH any garage knows where it stands. Never is there occasion for dispute, as the CALCULAGRAPH records when the job is started—when it is ended—and it gives the elapsed time. Thus it eliminates all chance of error—pleases the public and makes "more" money for the garage.

Garage Booklet on Request

DEPT. 77

THE CALCULAGRAPH COMPANY

30 Church Street

NEW YORK CITY

May we show how
profits can be
increased.

STORM

CYLINDER RE-BORING MACHINES



Storm Cylinder
Reboring Machine

Of course you are interested in getting the maximum profits out of your repair business. You owe it to yourself to investigate a line of equipment that is saving time, labor and money in hundreds of repair shops.

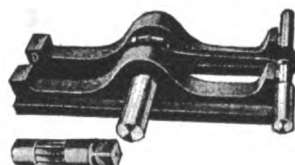
Our line includes the

STORM Cylinder Reboring Machines
STORM Piston Vice
STORM Valve Port Renewing Outfit
STORM Connecting Rod Bearing Reamer, Jig and Straightening Gauge

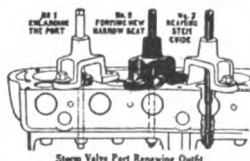
Write today for catalogue
giving us your jobber's name

STORM MFG CO.

1714 4th St. THOMPSON, IOWA



The Storm Connecting Rod Bearing
Reamer, Jig and Straightening Gauge

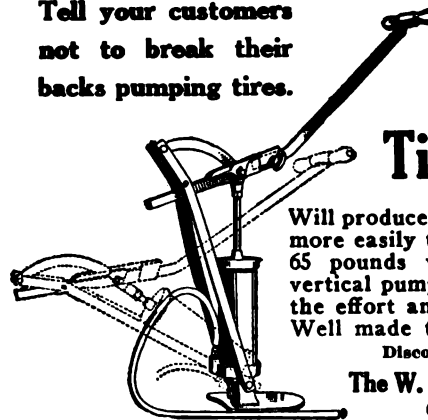


Storm Valve Port Renewing Outfit

Tell your customers
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backs pumping tires.

\$5.50

Jensen Tire Pump



Will produce 90 pounds pressure more easily than you can pump 65 pounds with the ordinary vertical pump, with one-quarter the effort and in half the time. Well made throughout.

Discounts on request

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Hydraulic Arbor Presses

work easier
than any
others.

We make
many sizes
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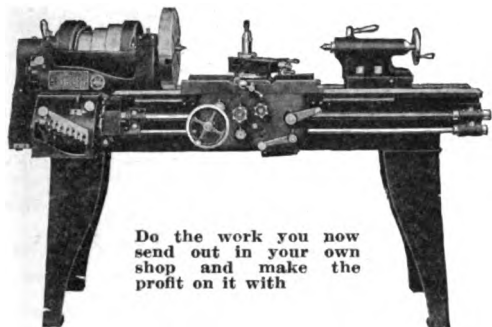


Tire Applying Press

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Lourie Manufacturing Co.
SPRINGFIELD, ILL.

Do Your Own Lathe Work and Increase Your Profits



Do the work you now
send out in your own
shop and make the
profit on it with

MONARCH LATHES

Recognized by repair men as Best for Garage Use, very accurate, rigidly constructed, modern in design, quick and easy to operate. Used in every class of work from the finest tool room work to the production work of the largest factory. Furnished with taper attachment, milling, key-way cutting, gear cutting and other useful attachments for garage work.

Size shown above 14" x 6'. Other sizes 16, 18 and 20".
Prices are within reach of every garage owner.

Write today for catalog No. 11 and prices

The Monarch Machine Tool Co.

America's Largest Lathe Builders

101 Oak Street

Sidney, Ohio



Battleships like this ride the water easily.

because their great weight gives them ample stability. We have likewise solved the problem of giving the Ford the stability and smooth running qualities possessed by heavier cars.

W&C SHOCK ABSORBERS are also built for service and comfort

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"Give New Customers A Chance To Find You"



use a Federal Electric Sign

The Federal Electric Sign attracts customers to your garage. It creates the impression that you are thoroughly up-to-date and modern—it works for you day and night.

The Federal Electric Sign is made of porcelain-enameled steel. It cannot wear out, rust or decay. Costs but a few cents a day for current—no other maintenance expense. An occasional washing keeps it sparkling like new.

You have 12 Months to Pay for this Sign—the first payment brings you the sign. This energetic salesman will pay for itself many times over. Send the coupon today for full information.

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Federal Sign System (Electric)

Lake and Desplaines Sts., Chicago

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on the car equipped with

UNIVERSAL or MARVEL SPARK PLUG INTENSIFIERS

There is a big demand for a device that insures satisfactory operation from spark plugs which are worn out or on which the insulation is broken; or a plug fouled with grease or carbon. These INTENSIFIERS will make such plugs fire perfectly. They indicate instantly whether a cylinder is missing and whether the ignition system is in perfect order. They give the spark more energy—producing more power and a smooth running motor. They eliminate carbon, waste of gas, cleaning the plugs and guessing which cylinder is missing.

EVERY ONE OF YOUR CUSTOMERS WILL WANT THEM

JOBBER and DEALERS—Your profit is liberal.
Write today for our attractive proposition.

UNIVERSAL MFG. & SALES CO.

550 W. Harrison Street

CHICAGO, ILL.

ATTENTION

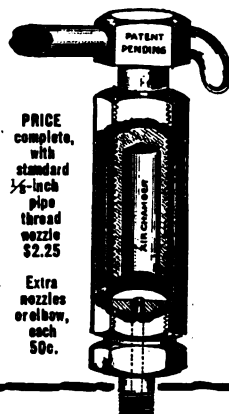
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We manufacture Electrical Testing, Charging and Magnetizing Instruments, and publish Books covering all Motor Car Electric Systems and Tire Repairs and Vulcanizing. New illustrated catalogue ready. Write today for it. **C. Dealers wanted.**

H. E. PHILLIPS & CO.
Dayton Ohio

The "75" Among Grease Guns

STRICKLER'S HIGH PRESSURE GREASE AND OIL GUN



PRICE
complete,
with
standard
1/4-inch
pipe
thread
nozzle
\$2.25

Extra
nozzles
elbow,
each
50c.

This grease gun exerts a pressure of at least 900 pounds at the nozzle, and is the only gun in existence that will force rust, corrosion and old, hard grease out of a clogged bearing and leave it filled with fresh grease.

Used and endorsed by the manufacturers of the Pierce-Arrow, Franklin and other cars.

Lubrication is the life of the car—
Clogged or dry bearings the death of it.

For descriptive circular or specific information
write to

T. H. STRICKLER

4231 Wilcox Street

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THE OPPORTUNITY IS TREMENDOUS

Hundreds of thousands of new automobiles being sold every year.

OPEN A TIRE REPAIRING SHOP



Most profitable business on earth requiring such small investment.

VANDERPOOL VULCANIZER

repairs tires exactly as made at the factory. Write at once for FREE TIRE REPAIRING MANUAL and full particulars.

In answering address
Dept. 69.

WM. VANDERPOOL CO. : Springfield, Ohio

"Sly" Interchangeable Rear Tire Carriers



for Ford and Chevrolet "490" tires, holds either casing alone or casing on demountable rim; has expansion grip inside of rim; avoids all contact or chafing; accommodates lamp and number plate. Has provisions for locking through holes in adjusting turnbuckle. A big seller every dealer should stock.

If your jobber does not list this tire carrier, write us for complete catalog of tire carriers, "Better" Springs, and "Better" Bumpers.

NEW ERA SPRING & SPECIALTY COMPANY
1152 Hamilton Ave., Grand Rapids, Michigan

"CURKO" SOCKET WRENCHES

Are turned from the best Solid Bar
Stock and are Heat Treated. For

STRENGTH and RELIABILITY

They are unexcelled. Ask for dealer's discount.

Price
\$1.50



Graham Roller Bearing Co., Coudersport, Pa.

WELDING PLANTS for the Garage

BERMO WELDING PLANTS

are made in many styles. There is one that will just fill your requirements.

Welding
is highly
profitable

Write for particulars

A.J. BERMO CO.
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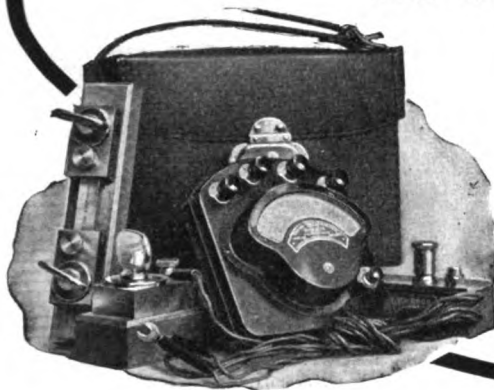
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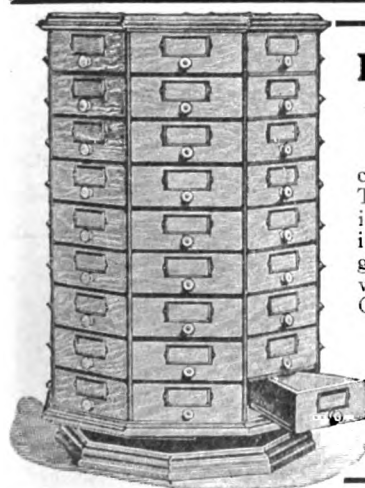
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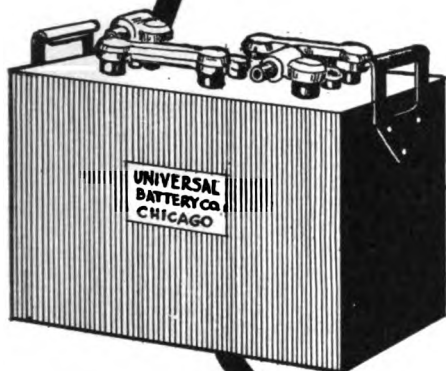
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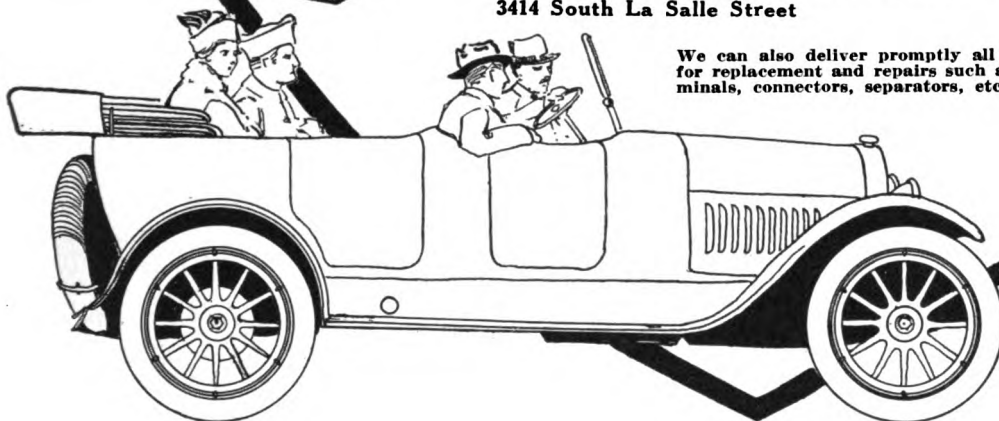
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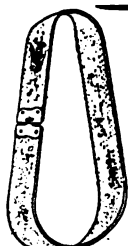


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Index to Advertisements

| A | | J | |
|---|----|---------------------------------------|-----------|
| Advance Automobile Accessories Corp.....3 and | 5 | Jenkins Vulcan Spring Co..... | 31 |
| Akron Rubber Mold & Machine Co..... | 49 | Jewell Electrical Instrument Co..... | 61 |
| American Accessories Co..... | 59 | K | |
| American Bolt & Screw Case Co..... | 57 | Kennedy Car Liner & Bag Co..... | 56 |
| American Machine Products Co..... | 50 | Kimball Tire & Rubber Co..... | — |
| American Technical Society..... | — | L | |
| Atlas Auto Supply Co..... | 8 | Lawrence & Co., L..... | 58 |
| Auto Compressor Co..... | 23 | Lourie Mfg. Co..... | 54 |
| Auto Engine Works..... | 58 | M | |
| Auto Parts Co..... | 58 | McDaniel Rubber Co., Leo..... | — |
| Auto Spring Repair Co..... | 56 |54 and | 57 |
| Auto Wrecking Co..... | 58 | Marmon Chicago Co..... | 46 |
| B | | Marvel Carburetor Co..... | 52 |
| Baird Equipment Co..... | 57 | Marvel Machinery Co..... | 48 |
| Beck & Corbitt Iron Co..... | 57 | Mechanical Belt Co..... | 62 |
| Bermo Co., A. J..... | 56 | Miami Trailer Co..... | 55 |
| B. & M. Mfg. Co..... | — | Monarch Machine Tool Co..... | 41 |
| Boe Co., H. M..... | 57 | Mueller, R. & S. Co..... | — |
| Brunner Mfg. Co..... | 45 | N | |
| Buettner Co., Chas. H..... | 59 | National Cash Register Co..... | 43 |
| Butler Mfg. Co..... | 58 | National Rubber Filler Co..... | 53 |
| Buffum Tool Co..... | — | National Wire Wheel Works..... | 35 |
| Burgess Mfg. Co., W. S..... | 47 | New Era Spring and Specialty Co..... | 56 |
| C | | New York Coil Co..... | 59 |
| Calculagraph Co..... | 54 | No-Leak-O Piston Ring Co..... | — |
| Cassidy Co., Edward A..... | 33 | Norma Company of America, The..... | 6 |
| Catelain, Andre G..... | 58 | P | |
| Champion Pneumatic Machinery Co..... | — | Paro, H. G., Co..... | 50 |
|Inside Back Cover | — | Phillips Engineering Co..... | 52 |
| Chicago Baling Press Co..... | 57 | Pondelick Bros..... | 52 |
| Chicago Solder Co..... | 46 | Pruyn Ball Bearing Works..... | — |
| Curtis Pneumatic Machinery Co..... | 21 | R | |
| D | | Reliance Co..... | 48 |
| Dayton Electrical Mfg. Co..... | — | Remort Mfg. Co..... | 41 |
| Dearborn Truck Co..... | — | S | |
| Denby Motor Truck Co..... | 7 | Shaler Co., C. A..... | 50 |
| Detroit Auto Radiator Co..... | 58 | Schrader's Son, Inc., A..... | 59 |
| Dunton Co., The M. W..... | 52 | Spencer's Sons, I. S..... | 59 |
| E | | Sprague Mfg. Co., E. H..... | 58 |
| Eccolene Company..... | — | Standard Auto Salvage Co..... | — |
| Ever-Tight Piston Ring Co..... | 62 | States Chemical Co..... | — |
| F | | Stewart, F. W..... | 54 |
| Federal Sign System (Electric)..... | 55 | Storm Mfg. Co..... | 56 |
| Flexlume Sign Co..... | 44 | Strickler, T. H..... | 58 |
| Foster Bros. Mfg. Co..... | — | Sunderland Machinery & Supply Co..... | — |
| Franklin Mfg. Co..... | — | T | |
| G | | Times Square Auto Supply Co..... | 51 |
| Ganschow Co., William..... | 50 | Tungsten Mfg. Co..... | — |
| Garden City Spring Works..... | 61 | U | |
| General Utility Company..... | 4 | Universal Battery Co..... | 59 |
| Gill Mfg. Co..... | — | Universal Mfg. & Sales Co..... | 58 |
| Globe Mfg. Co..... | 39 | U. S. Air Compressor Co..... | 49 |
| Graham Roller Bearing Co., The..... | 56 | Utilities Company..... | 21 |
| Gray-Heath Co..... | 25 | Utilities Sales Corp..... | 4 |
| Greer College of Motoring..... | 58 | V | |
| H | | Vanderpool Vulcanizing Co..... | 56 |
| Halladay Co., L. P..... | 29 | W | |
| Haney & Co., J. H..... | 47 | Wagner Specialty Co..... | 59 |
| Harton & Co., Inc., Thos. J..... | — | Warshawsky & Co..... | 58 |
| Harvey Spring & Forging Co..... | 37 | Waxit Mfg. Co..... | 27 |
| Hinckley Machine Works..... | 48 | Webber & Co., P. H..... | 55 |
| Hobart Bros..... | 53 | Weston Electrical Instrument Co..... | 57 |
| Hoffman Mfg. Co., Andrew..... | — | Wisconsin Auto Top Co..... | 51 |
| Holmes & Bros., Inc., Robert..... | 52 | Wood & Safford Machine Wks..... | 61 |
| Howell Co., The W. H..... | 54 | Z | |
| I | | Zinke Co..... | 21 and 41 |
| Inland Machine Works..... | — |Inside Front Cover | — |

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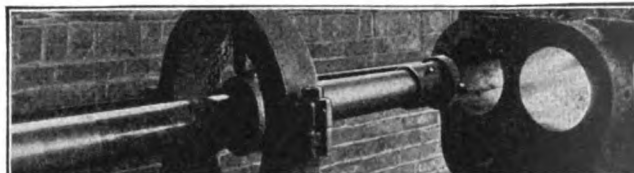
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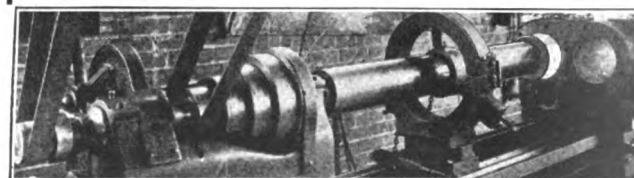
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When you attempt to classify the number of possible buyers of MIAMI TRAILERS, you will be astonished at the diversity of sales you can make.

This is one of the biggest arguments in their favor.

Practically anybody who has either an automobile or truck—and delivering or hauling to do—will be impressed with MIAMI TRAILERS because of their moderate purchase price—and efficiency.

Just give us an opportunity to show you that you can make "substantial profits"—merely write us and say YOU are interested—and later you will thank us that you did.

**THE MIAMI
TRAILER CO.**
TROY, MIAMI OHIO



Have you a "Piston Ring Primer" in your pocket? It has 16 pages of valuable information. Free to you.

Zelnick EVER-TYTE Piston Rings—they just naturally make you an Optermist.

MANUFACTURED BY

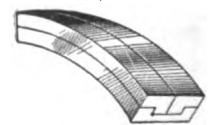
The Ever Tight Piston Ring Company

3124 LOCUST STREET

AG&AD 4-19

ST. LOUIS, MO.

RIGHT ANGLE
INTERLOCK



Ever-Tyte Bill

Says:- Well, here I am again—I'm gettin' as gabby as an old fish-woman, but I got to get it out o' my sistern.

These days you see an' hear tell o' so many fellers in our line o' bizness, standin' up on their hind legs, cryin' about their bizness is shot to pieces,—what's goin' to happen now that the war is over?—their cozzen's got the Floo—their dog's got the mange,—and things in general has gone to rack and roon, to hear 'em tell it.

A lot of these same birds has got money in the bank, Liberty Bonds tucked away under the mattress, a fine happy fambly at home, and is smokin' two-bit segars.

It sure riles me to here these guys speel,—it's just plane cold feet—there's some guys just got to have things handed to 'em on a gold platter.

If a few of these here pessermists would get out and dig and figger and plan fer the big bizness that's got to be took care of now that we finished mussin' up the apposel o' kultur, they'd be a dam site better off—This thing called Optimism is mighty handy to have around—it pulls a guy thru a many tite place—I'm fer it, and fer

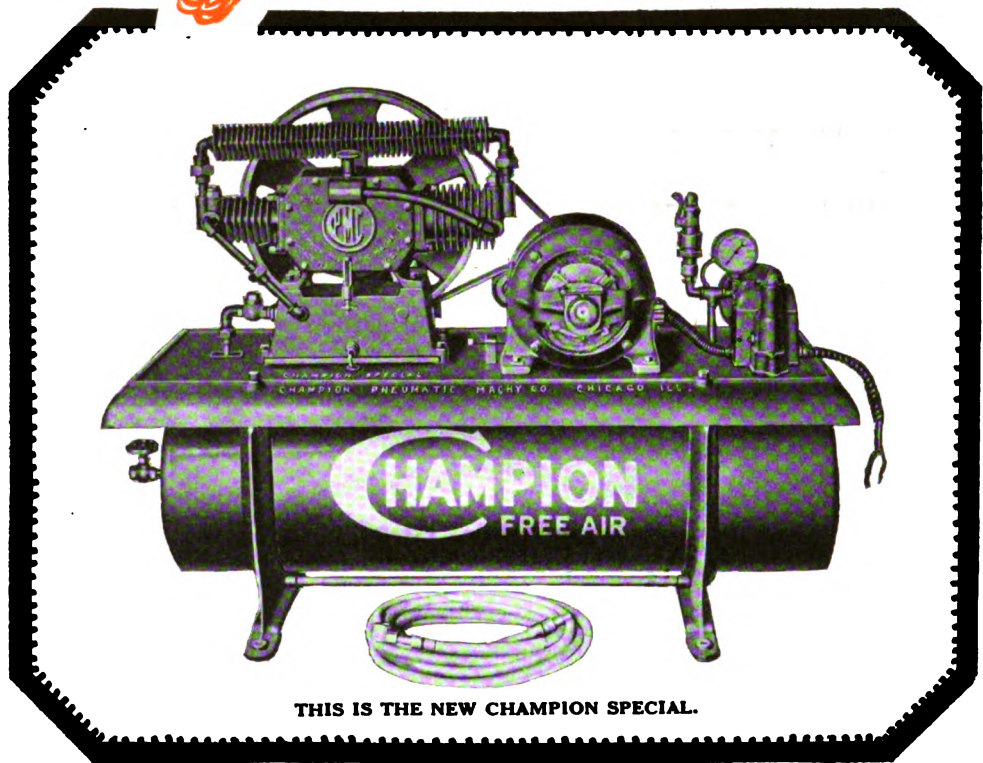
The CHAMPION Air Compressor

Speedy
Powerful
Dependable

Free Air Service is not free as far as the garageman is concerned. It costs him real money for equipment and for operating cost.

The return on this investment is the good will that the service rendered produces among the motoring public. The best way to keep down the cost of your air service is to select an air compressor that will require little attention once installed, and will operate at minimum cost.

The "high grade" features of the Champion Air Compressor assure continuously good service under all conditions.



THIS IS THE NEW CHAMPION SPECIAL.

To obtain a maximum return in the form of good will, you must have an equipment that will give rapid, reliable service under all conditions—The CHAMPION does this.

With the above facts in view, the CHAMPION AIR COMPRESSOR should appeal to you strongly.

10 EXCLUSIVE MECHANICAL FEATURES:

1. Annular Ball Bearing Crankshaft.
2. Cylinders and Valve Heads Cast Integral.
3. No joints or gaskets to leak.
4. Bronze Connecting Rod Bearing—Babbitt lined.
5. Mushroom valves in Bronze Cages. (Special arrangement for regrinding valves.)
6. Removable Cylinders.
7. Fan Blade Fly Wheel.
8. Drop Forged Crankshaft.
9. Hollow wrist pin, hardened and ground, securely fastened in piston.
10. All parts standard and interchangeable.

**The Champion Pneumatic
Machinery Co.**

*Manufacturers of the most complete
High Grade AIR LINE SPECIALTIES*

1402 S. Michigan Ave.

CHICAGO





Doesn't the Manufacturer You Represent Use Oplex Signs?

MANUFACTURERS of motor cars and accessories are coming more and more to include electrical advertising in their merchandising.

They find that an Oplex sign will do more than any one thing to tie their nationally advertised trademark to the dealer's door.

How about the manufacturers you represent?

Aren't they willing to co-operate with you in putting up an Oplex sign?

Why don't you ask them?

But don't forget to say "Oplex" the sign with the raised, white letters on a dark background.

They are the signs that dominate the street 24 hours a day—raised, white letters on a dark background in the day time, unbroken letters of light at night.

Almost any trademark can be perfectly reproduced in Oplex characters.

We'll be glad to send you a sketch.

THE FLEXLUME SIGN CO., Niagara St. and Potomac Ave.
BUFFALO, N.Y.

Pacific Coast Distributors:
Electric Products Corp.
Los Angeles, Cal.

Canadian Distributors:
The Flexlume Sign Co., Ltd.
Toronto, Ont.

AMERICAN GARAGE & AUTO DEALER



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JUNE

1919

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\$1.00 Per Year



“—saves two-thirds of my Tire Expense

“Once a week I go over my tires—and seal the little holes and cuts that ruin tires by permitting dirt, oil and water to reach and rot fabric. With the SHALER Vul-Kit I ‘vulcanize’ these holes with tough, new rubber that makes a lasting job of it. It takes only a few minutes—but keeps my tires good as new—prevents tire trouble—doubles my mileage—and actually saves two-thirds of my tire expense.”

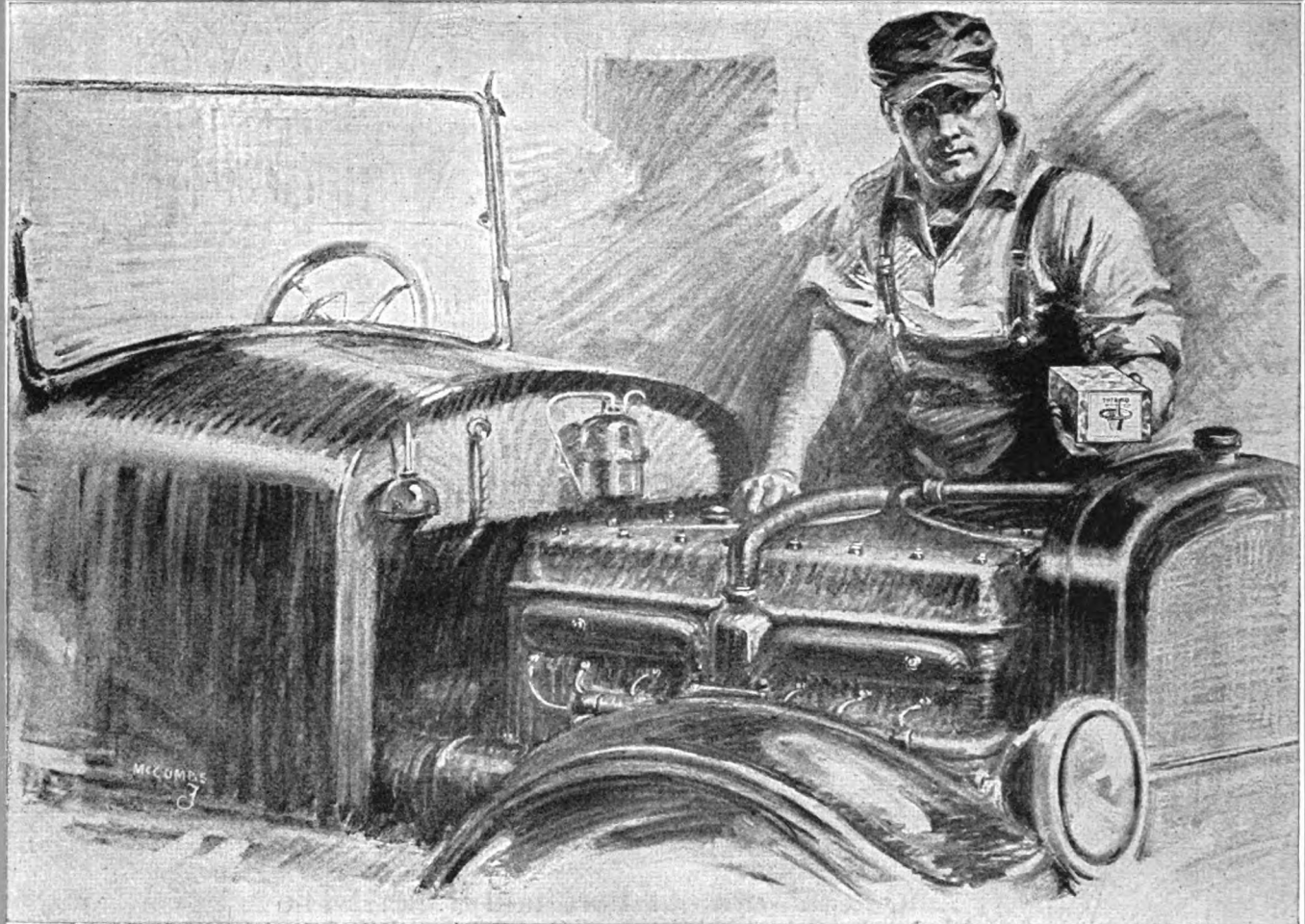
Sell the **SHALER** VUL-KIT

It's easy to sell. Motorists are looking for a tire-saver like this. Their word-of-mouth endorsement of the SHALER to their friends gives you a chain of sales. The repair material they buy of you to use with this vulcanizer gives you “repeat” profits that come to you regularly—without effort. You make a good profit selling the Vul-Kit itself and big, steady “repeat sale” profits.

SHALER Vulcanizers are advertised regularly throughout the year. Motorists are now reading the large, dominant advertisements in the leading national and motorist publications. Every car-owner needs a SHALER Vul-Kit—sell it to him and make these big steady profits for yourself. Complete Outfit only \$3.50. Price slightly higher west of the Rockies and in Canada.

Order From Your Jobber Now—Write Us for Catalog
of the complete line of SHALER Vulcanizers for garages, tire repair shops and motorists' use

C. A. SHALER CO., 355 Fourth Street, Waupun, Wisconsin
Oldest and Largest Manufacturers of Vulcanizers in the World



Thousands of garage and repair men are now actively urging motorists to install Inland Piston Rings

This emphatic recommendation of Inlands by the very men who know what a piston ring should be to do its work properly, explains the tremendous sale of Inlands everywhere.

The actual mechanical perfection of the Inland ring itself, so recognized by motor mechanics the world over, has been the foundation of Inland sales growth.

The Inland is a perfected piece of mechanism that motor mechanics and motor owners can absolutely rely upon to give the most efficient piston ring service.

Nearly 4,000,000 Inlands are in use. Thousands of dealers are profiting by their sale. How about you? Jobbers everywhere stock Inlands—ask yours.



Inland Machine Works, 1645 Locust Street, St. Louis, U. S. A.

INLAND

ONE-PIECE PISTON RING

Haul bigger loads using

CORK ADVANCE **INSERT**

Transmission Brake Lining for Fords

Advance Cork Insert means more pull to start and stop your loads. Here's an example of what it does for a Ford Truck: "We found it impossible to haul more than 1500 pound loads with our Ford and trailer. The engine would go dead in trying to start the load in low gear. But since using Advance Cork Insert, loads as high as 2500 pounds are being hauled without any difficulty in stopping or start-line. They produce a smooth friction action without jerk or chatter."

"We use nothing but Cork Insert" says a large New York trucking concern, "because loads can be started and backed by our Ford trucks that cannot be budged with ordinary lining in the transmission."

Sold in this
red and
black
box

**\$3⁰⁰ PER
SET OF 3**

ADVANCE

CORK INSERT
TRANSMISSION LININGS FOR FORDS

*"One Set Will Outwear
3 of Any Other Kind"*

*"Makes A
Great Car
Greater"*

\$3

per set
of three.

Rockies West, \$3.25
Canadian, \$4.50

Advance Cork insert also means a *sure* brake. It brings the heaviest load to a smooth, easy stop. Saves the car. Saves accidents. Saves worry.

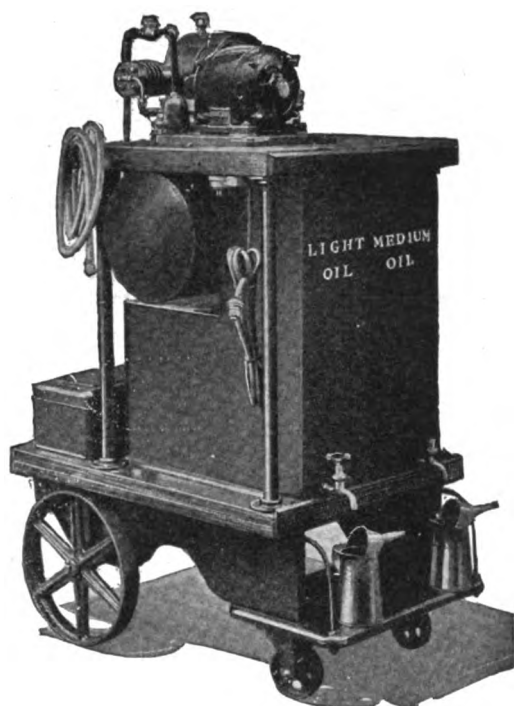
The use of Advance Cork Insert is economy. Its performance over the past 24 months proves that it outlasts several sets of ordinary linings. It wears so well that it is cheapest in the long run.

Be sure you get the genuine Advance Cork Insert. It is easy to identify, by the red and black package, and the name in big letters, "Advance Cork Insert."

**Advance Automobile
Accessories Corporation**

Dept. F-7 56 E. Randolph St., Chicago, Ill.

"Put in a Quart of Oil"



Many a time this statement has been made to the garage man who uses the UTILITY MODEL to serve his customers with free air, thus making a sale out of his free air service. The UTILITY MODEL acts as a silent salesman for every garage in which it is used.

The average motorist is perfectly willing in some manner to repay the garage man for filling his tires with good, clean air, and his opportunity presents itself when the UTILITY MODEL'S oil service, which is combined with the air compressor, is in plain view in or outside of a garage.

"Put in a quart of oil" is his usual request. Thus the duo-fold service of the UTILITY MODEL turns a direct liability into an asset.

TWO CYLINDER GENERAL AIR COMPRESSORS

Are made in eight different models, both stationary and portable, suitable for any size garage. They are constructed along the best mechanical lines and with the best of material and are guaranteed to give satisfaction. If interested in any of the models listed send for booklet "The Low Cost of Cool Air."

General Utility Company

Manufacturers

1330 Ogden St., Philadelphia, U. S. A.

Utility Sales Corporation

Sole Factory Distributors

Suite 808, New Stock Exchange Bldg., Philadelphia, U. S. A.

LIST OF MODELS

Direct Stationary

Direct Portable

Victor

Longfellow

Utility

Portable Service

Service

Longlife

Portable Tank

Send for Prices

**In
boxes**



**In
rolls**



Stays soft longer because better treated

The secret White Stripe Treatment keeps the fabric soft — proofs it against the hardening action of oil.

To present a good braking surface to the drum of the Ford car, lining must be soft.

ADVANCE WHITE STRIPE Transmission Lining is loaded with treatment, yet the fabric remains soft and flexible.

At the same time, this treatment absolutely KEEPS OUT hot oil. Oil can't get hot enough in the Ford

transmission to draw the treatment out of White Stripe Lining.

That's why it STAYS SOFT. Does not harden down or burn out. Gives you better braking action than you can possibly secure from any other plain lining. Try it!

You can instantly tell Advance White Stripe whether you buy it from the roll or in the box. Every inch marked with white stripe.

In boxes \$2 per set of 3

Rockies West, \$2.25: Canada, \$3

In rolls 32 cents per foot

Rockies West, 35c Canada, 40c

Advance Automobile Accessories Corporation
Dept. F-7 56 East Randolph Street, Chicago, Ill.





"NORMA" PRECISION BALL BEARINGS

(PATENTED)

No mere examination of a new machine, however thorough, can give a correct estimate of its in-built serviceability—which is the difference between its "wearing qualities" and its "wearing-out qualities." Only the test of time and service can reveal this in proper proportions. Therefore, records must be looked into.

The records for serviceability made before the war—and the records made throughout the war—by "NORMA" equipped ignition apparatus and lighting generators, explain why today, as for years past, they have been identified with the most serviceable cars, trucks, tractors, power boats and airplanes.

**Be Sure—See That Your
Electrical Apparatus
is "NORMA" Equipped.**

THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings.



AMERICAN GARAGE & AUTO DEALER

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|--|----|
| Self-Protection Demands Support for Trade Body... | 20 |
| Many Former Soldiers Are Well Trained Mechanics... | 20 |
| No New Cars?—Sell Rebuilt Ones | 20 |
| One Who Wants to Sell | 20 |

GENERAL

| | |
|---|-------------|
| Cultivate Your Garden! | 9 |
| N. A. D. A. Board Fights "Dry" Law Peril, by Harry G. Mook | 10-11 |
| Beautified Station Attracts Trade, by Felix J. Koch .. | 11 |
| Solves the Problem of Quick Bills, by A. S. Hatcher .. | 12-13-14-15 |
| Cash or Trade Acceptances for Bills, by A. S. Hatcher .. | 15 |
| Special Bodies Will Sell Rebuilt Cars, by R. B. Johnston | 16 |
| Accounting for Automotive Dealers, by J. Newton Boddy | 17-18 |
| Pilfering Tools Drives Profits Away, by C. M. Adams .. | 18 |
| Courtesy Wins Unexpected Car Sale, by Lester G. Herbert | 19 |
| Cloud Resumes Post as Advance Advertising Manager .. | 22 |
| Prices Not Coming Down, Says Kahn | 24 |
| Au-To Air Compressors Have No Complicated Parts .. | 24 |
| Electric Signs Hold Accessory Trade, by Arthur W. Park | 26 |
| Gray-Heath Company Holds Sales Meeting in Chicago .. | 30 |
| New Era Specialty Plant Has "Fortunate" Fires | 30 |
| Chicago Office for Utility Compressor and Trex Rim Tool | 36 |
| Aksala Carbon Remover Comes in Attractive Can | 36 |
| New Truss Bumper and Fitting Made by Halladay .. | 38 |
| Liberty Motor Support for Ford Engines | 38 |
| Buettner Products Are Finding Ready Sale | 38 |
| Spee-Dee Counter Display Card Tells Selling Story Instantly | 38 |
| Trailer Makers Have Big Program, by H. W. Perry .. | 42 |
| Makers Set Dates for Chicago and New York Shows .. | 42 |
| Corlew Manages Vulcan Spring Branch in New England | 44 |
| Advance Cork Insert Gains Big Distribution in Two Years | 44 |
| Production of Jackson Air Compressors Is Resumed .. | 44 |
| Trade Experts Endorse Shaw Signal Device | 44 |

DEPARTMENTS

| | |
|--|-------|
| Welding, Cutting and Brazing Practice, by David Baxter | 21-22 |
| Readers' Questions and Answers, by G. L. Shelley .. | 28-30 |
| How to Make the Shop Profitable, by E. B. Hinrichsen | 32 |
| Practical Hints for Shop Mechanics, by G. L. Shelley .. | 34-36 |
| Accessories—They Bring in Money, by E. B. Hinrichsen | 38 |
| Solutions of Mechanical Problems, by E. B. Hinrichsen | 40 |
| From the Truck and Trailer Field | 42 |
| News of Manufacturers and Jobbers | 44 |
| Accessories and Garage Equipment | 46-48 |
| Buyers' Reference | 60 |
| Index to Advertisers | 61 |

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FROM Moberly, Missouri, to Singapore, Straits Settlement, is a long way. The conditions under which trucks must work in the two cities are radically different. Yet the reason back of Denby popularity is the same in both places,—dependability and freedom from mechanical troubles.

This outstanding feature of Denby trucks is valuable, even in a large city, next door to a thoroughly stocked service station, for it means low costs and continuous work. But far from service stocks or expert care, it is a vital factor—it spells the difference between successful operation and failure.

This dependability is one of the prime reasons for the world-wide popularity of Denby trucks.

DENBY MOTOR TRUCK COMPANY
DETROIT

The Denby line is complete, ranging in capacities from one to six tons. This, together with the options of wheel-base, gives a Denby fitted to any needs.



This is why SPEE-DEE



YOU can sell your customers files, emery, sand or sandpaper for their heavy cleaning jobs — but will they come back to you for more?

Sells!

SPEE-DEE is compounded to clean everything — injure nothing. Its action is non-abrasive — entirely different!

It is **SAFE** to use on fine woodwork yet **EFFECTIVE** on weather-stained windows. Just as good for automobile tops, seat covers, celluloid curtains, fenders or the mud-plastered running gear.

Does not contain acid, lye or grit. So it is smooth, soft and does not scratch. The secret of what it IS belongs to SPEE-DEE.

Write now for our **DIFFERENT** Selling Plan. We'll show you why SPEE-DEE is the fastest moving article that you can carry in stock. Live dealers everywhere are answering the demand.

**States
Chemical Co.**
680 West Austin
Avenue
CHICAGO



CAN'T HARM HANDS! SPEE-DEE has another **BIG** Selling Point — **IT WON'T HARM THE HANDS** Take just one guess how this will appeal to your women customers! You can **GUARANTEE** it to be harmless.

AMERICAN GARAGE & AUTO DEALER

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

Vol. X. No. 6

CHICAGO

June, 1919



Cultivate Your Garden

American farmers are raising a record wheat crop, setting an example to every retail automotive tradesman. Everyone has a business garden of his own, in the city or the country. The harvest depends on how much attention is devoted to cultivating the crop, whether it be profits on business, or cash for farm produce.

Nearly all motor tradesmen cultivate that plant in their garden which we call passenger cars. But even as experienced farmers believe in diversified crops so should tradesmen cultivate other profit producing plants called accessories, trailers, tractors, and trucks.

The accessory plant especially should be cultivated now when it is hard to get enough new passenger cars to fill orders. There is an article on another page that gives practical advice about getting and keeping accessory customers.

N.A.D.A. Board Fights 'Dry' Law Peril

Directors of National Dealers' Body Take Steps to Combat Enforcement of Measures That Threaten to Cause Loss on Cars Sold on Conditional Bills of Sale—Endeavor to Change Interpretation of Tax on Truck Chassis Sales

By Harry G. Moock,

Business Manager, National Automobile Dealers' Association.

How prohibition laws are threatening the safety of the automobile industry was brought out in the concluding session of the directors of the National Automobile Dealers' Association who convened at St. Louis June 2-3. Every officer and director was present for the first time in the history of the organization.

The prohibition menace to the dealer has been brought about through the fact that in numerous dry states Federal revenue agents have confiscated automobiles carrying liquor. In many cases they had been sold on conditional bills of sale. After the cars have been seized they are either sold or destroyed, the dealer is deprived of his car and in many cases it is impossible to recover the balance due on the purchase. This procedure has been upheld in the United States Circuit Court of Appeals for Georgia, despite the fact that the dealer had no knowledge of the purpose for which the automobile was to be used. Cases also are pending in Colorado, Washington, Virginia and California.

The directors made a pledge of "adequate financial" support to the Georgia dealers fighting this case which will be taken to the United States Supreme Court and if they lose there the board will take steps to obtain a repeal of the law in Congress under which cars are confiscated.

Impairs Insurance.

One of the most serious features of the confiscation is that the Federal Reserve Banks are considering a proposal to refuse to rediscount automobile dealers' commercial paper when cars are sold on such conditional bills of sale. It has also seriously impaired owners' chances to insure their cars.

Many insurance companies have quit writing automobile theft insurance because stolen cars are so used and confiscated and others are withdrawing bodily from the states

The Association adopted a resolution supporting the Townsend Federal Highway Commission bill, a measure to create a national highway commission with jurisdiction over highways similar to that exercised by the Interstate Commerce Commission over railroads.

A protest was sent to the Treasury Department against a Revenue Bureau ruling that whenever a dealer adds a part or an accessory to an automobile and sells the car and the added part on one bill that he is a further manufacturer and subject to a 5% tax on his total sale price.

A report was made that the Association is working on the draft of a uniform automobile law for adoption in all the states regulating licensing, taxation, police regulation and liability for negligence and the like in the operation of cars.

Want Tax Repealed.

Methods to be pursued in obtaining the repeal of the five per cent tax on automobiles and parts and the three per cent tax on trucks were discussed. In this connection a telegram was sent to Senator King of Utah, who has introduced a bill providing for the repeal of Section 900 of the War Revenue Act signed February 24, 1919.

Two bills in the House and one in the Senate of Congress were endorsed providing for Federal control of the automobile in interstate commerce. One of these bills was introduced by Senator Key Pittman of Nevada, the others by Representatives Sanders of Louisiana and Mueller of Illinois.

Internal Revenue Commissioner Roper's modified ruling in respect of truck chassis tax is still unsatisfactory to the N. A. D. A. directors. The new decision is as follows:

"Substitute in place of the next to last sentence of Article 15, Regulations 47, which reads as follows:

" 'A chassis is a part of an automo-

bile and taxable at the rate of five per cent when sold separately regardless of whether it is a chassis for an automobile truck or wagon or for any other kind of an automobile.' "

the following:

" 'A chassis provided with a superstructure of such design that it is without substantial additions adaptable for hauling heavy loads is an automobile truck or automobile wagon and taxable at the rate of three per cent. A chassis not so equipped is an "other automobile" taxable at the rate of five per cent. Unless the manufacturer has actual knowledge that the chassis is to be used as an automobile truck, or automobile wagon, or has in his possession at the time the chassis is shipped or sold (whichever is prior) an order or contract of sale with a certificate of the purchaser in writing printed thereon, or permanently attached thereto, showing that the chassis specified in the order is to be so used, the tax shall be five per cent upon the manufacturer's selling price'."

This decision was handed down in Washington June 3 and copies telegraphed by the Washington N. A. D. A. representative to the headquarters. It was received by the entire Board of Directors and the following protest sent to the Commissioner:

Protest on Ruling.

"That Treasury Department ruling of June 3, modifying Article fifteen, regulations forty-seven, that a 'chassis equipped provided with a superstructure of such design that it is without substantial additions adaptable for hauling heavy loads is an automobile truck or automobile wagon and taxable at the rate of three per cent' and that 'a chassis not so equipped is "an other automobile" taxable at the rate of five per cent' is not just, inasmuch as it ignores the fact that in trade usage the chassis is the unit of sale and universally disposed

of by the manufacturer and dealer without any superstructure.

"It is further declared that the classification is unjust because of the impossibility of dealers furnishing their manufacturers with certificates of the purpose for which such truck chasses are to be used as dealers buy great numbers of chasses which stand on their floors before disposed of to customers and that virtually in all of these instances the dealer would him-

self be unable to give the assurance demanded."

Local trade associations have been asked to protest against the modifications as issued and to ask that the decision be made on the basis suggested by the N. A. D. A.

Directors present were: F. W. A. Vesper, St. Louis, President; W. J. Brace, Kansas City, Mo.; P. E. Chamberlain, Denver, Colo.; H. L. Robertson, Houston, Tex.; Harry D. Aus-

tin, Seattle, Wash.; A. E. Maltby, Philadelphia, Pa.; George D. McCutcheon, Atlanta, Ga.; J. A. Graham, Minneapolis, Minn.; A. E. Mitzell, Canton, Ohio; P. H. Greer, Los Angeles, Cal.; E. W. Steinhart, Indianapolis, Ind.; Thomas J. Hay, Chicago, Ill., and the writer.

John H. Johnson of Boston was named as Director for the Eastern Division. The Directors will meet again in Denver in October.

Beautified Station Attracts Trade

Shrewd Supply Station Operator Paves Driveway with Neat Paving Material, Edges Roadway with Sod Kept Closely Clipped and Places Apparatus for a Free Air Hose Directly in Front of Flowerbed of Brightly-Hued Blossoms

By Felix J. Koch.

This is the story of one man's experience, but that one man's experience may very, very well prove your experience, mine, or that of any other dealer in automotive accessories, oils or gasoline.

This man was placed in charge of one of the very familiar little supply stations which are arising everywhere, America over, primarily for the sale of gasoline, lubricating oil—other oil for lamps—polish, and similar lubricating substances for motor vehicles.

In many places they are handling certain parts, and often even tires;

on the proven principle that if you need a tire, and can get it where you can have your vehicle's tanks filled with gasoline and oil in the meantime, you will go there, rather than to two places, each requiring an individual stop.

Howsoever, competition is the life of trade the big world over, and so with these dealers mentioned. Just so soon as one station puts in this,

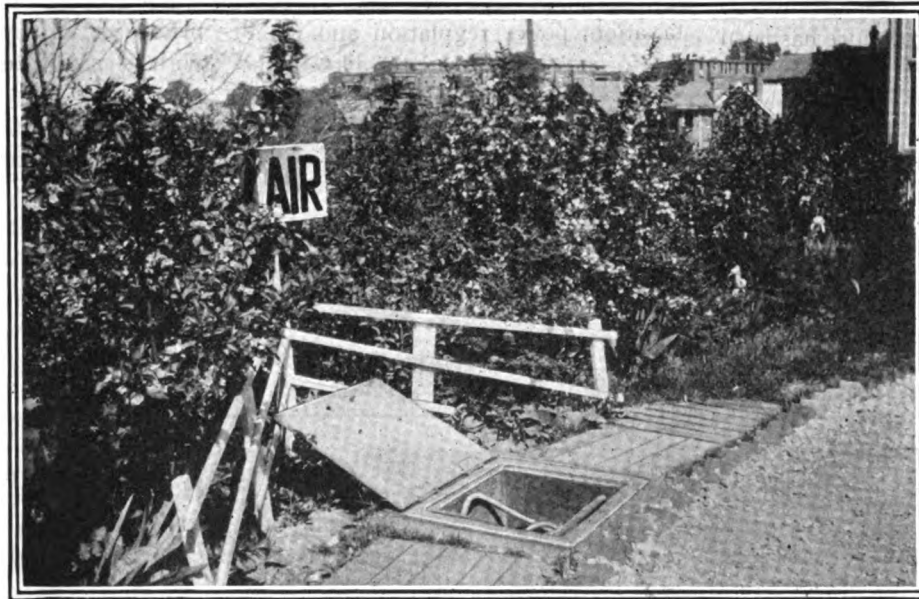
that, or the other accessory, it is not so long before you'll find the same, or a very similar make, in every other such station near. Rivalry is keen and sometimes a ruinous pricecutting campaign ensues.

of Nature will bring people, Nature lovers at heart, all them, in.

So this man has taken the drive that leads in, under the roof of his shed, and covered it with just the neatest of paving material to be found. This,

then, he has edged with sod, and a few runs with the lawn-mower, between respective sales, serves to keep that immaculate.

Behind this piece de resistance, there is the most attractive flowerbed of the photograph. Brightly-hued basil, in the season, gay-flowered geraniums; later in the fall, the salvias, or the dahlias, take the



Flowerbed Background Beckons Motorists to Use "Free Air" Hose at Supply Station.

Out of which there has come the use of much gray matter among these station keepers for getting business. Latterly one of them, more than all the rest in that section, has reverted to an old, old business axiom, but one too seldom applied to such otherwise ordinary matters as oil and gasoline.

This man realizes that beauty is ever, always, a magnet to the eye of passers, and that natural beauty, a bit

eye, instant, to the display there.

The flowers bring the eye to the free air hose; they make you recall that chances are you could use free air. You go into the driveway to help yourself to air. You note the pumps for gasoline or oil; with this, that and the other accessory. Everyone buys; and though he may not have beautified his place a-purpose, the big admiring public, do not leave him any poorer.

Solves the Problem of Quick Bills

Iowa Automotive Tradesman Evolves System of Accounting that Enables Him to Have Statements of Amounts Due Ready for Customers as Soon as Repairs on Cars Are Completed—Needs Little Time Now for the Bookkeeping

G. M. St. Clair, of the St. Clair Motor Company, of Vinton, Iowa, paused at his work to answer the office phone.

"Check out S. P. Cook," said the shop foreman, speaking over the wire from the rear of the garage. Mr. St. Clair took from a tray a repair job card bearing the name of Mr. Cook and stamped the time thereon with a recording clock stamp. A few minutes later Mr. Cook himself entered the office, wallet in hand. He was plainly excited about something. He shuffled his feet about as the customer ahead of him paid his bill and stowed the change away in his pocket.

"How quickly can you figure up what I owe you?" he asked. "I want to get over to Urbana to meet the interurban from Cedar Rapids."

Rapid Figuring.

Mr. St. Clair laughed. "It's already figured up," he said. "Our bill is \$21.55—\$6.90 for labor and \$14.65 for parts."

Mr. Cook expressed his surprise by a shrill whistle.

"Why the job was only completed just now," he ejaculated. "And you mean to tell me you've got it figured up already?"

For answer Mr. St. Clair handed his customer the repair card.

"It's as simple as A, B, C," he said. "On the front of this card we have charged you for overhauling your rear axle; that's a standard job. Price, one of our men, spent an hour tuning up the car—90 cents more, \$6.90. Our time clock rec-

The garage of the St. Clair Motor Company, authorized Ford agency at Vinton, Iowa, is a typical country town garage. At least, it is typical with respect to size and scope of service; in the efficiency of its office methods, this company stands in a class by itself.

The business was founded in 1912 by A. E. St. Clair. Two years later a garage was built and the business was incorporated with a capital of \$7,000. Eventually Mr. St. Clair took his two sons into the business. The elder became head of the work shop and stock, and the younger took charge of the office and car sales. In 1917 the company's business totaled \$58,000.

Having gained a knowledge of accounting while working in a bank, G. M. St. Clair installed a simple but comprehensive system of keeping books and records. This system enabled him to shift much of his own work to a girl bookkeeper and take over the management of the work shop and stock when his brother, H. H. St. Clair, left to become an expert motor mechanic for the government.

Some features of the system are described in a booklet published by the Burroughs concern, from which the information given herewith was taken.

ord on this card shows that one. On the back we have listed each part as it was removed from stock. The only step necessary to find out the amount of your bill was to foot up these figures. And here's the way!

He stepped to a Burroughs adding machine on the counter and tore off a piece of adding machine tape on which he had listed and totaled the items on Mr. Cook's bill. Each item had been plainly printed.

The Explanation.

When he saw the tape it would be no trick, Mr. Cook thought, to check it with the repair card. At the bottom was the amount, \$21.55. He had footed up the bill in the few moments between the time the foreman called him on the shop phone and the time Mr. Cook entered the office.

"That's my idea of quick bills for quick service," said Mr. Cook as he pocketed his change.

It isn't everybody, of course, who is in such a hurry to learn the amount of his garage bill, but in the office of the St. Clair Motor Company the Burroughs adding machine is used just the same in footing up the charges on all repair cards. In the case of cash jobs the total amount received is distributed among the various departments—so much for labor, so much for Ford parts, so much for supplies and accessories.

Post Books from Tickets.

In the case of jobs to be charged the girl bookkeeper makes out a charge ticket on which the charges

are likewise distributed, this ticket to serve as the medium for posting to the customer's ledger. The repair cards for charge jobs are marked "charge," those for cash jobs are marked "paid," and all tickets of both classes are filed in



St. Clair Motor Company's Establishment Has Fine Scenic Surroundings.

"I don't think many people have anything on us when it comes to speed and economy in statements," Mr St.

Front of repair card. On other side accessories and parts are listed, with unit prices and extensions. The extensions are listed and the sum printed as a sub-total. Labor charge total is then listed and the Burroughs provides the correct total of all charges.

A Statement Made on the Burroughs.

"Before we got the Burroughs it used to take two days of one person's time at the end of the month to make

Every morning the bookkeeper lists and totals on the Burroughs the cash sales and charge sales in each depart-

Bank Deposit Slip Made on a Burroughs.

ment and credits the various accounts in the general ledger. The balances are extended daily by hand, so Mr. St. Clair can tell at a glance just what profit has been earned in each depart-

ment, or, if the balance is a debit balance just how much of his original capital he still has invested in that account.

"This departmentizing plan has been a big help to us," Mr. St. Clair said, "in showing us just where our profits are, what lines to build up and what lines to reduce. We used to think we were making money on gasoline, but when we began to keep records we found we were not. Of course, we still have to sell gasoline as a service measure, but we don't fool ourselves any more by thinking it is making us money.

"On the other hand, we never knew before that tires and tubes were so profitable. As a result of what our records taught us we have gone after the tire and tube business.

"With the Burroughs we compile a lot of useful figures that we couldn't stop to compile by hand. In the hearing of another Ford agent one day I spoke of free labor on cars after they are delivered as a factor of selling expense.

"'Whadda ye mean, free labor?' he asked. 'I thought the direct selling expense was all there was to it.' I told him that for some time after a car was delivered we made no charge for such little services as tightening the 'high,' taking up the play on wheels or answering a call to the country to start a new car.



This Shows G. M. St. Clair at His Adding Machine Handing a Bill to a Customer and Proving His Contention That It Is Better Not to Do by Hand Something That Can Be Done More Quickly and Accurately by Machine.

"Well, the cost of this service is cutting into profits somewhere, isn't it?" I asked. He admitted that it sounded reasonable. I told him we always credited shop labor with this expense and charged it to our Ford



Non-Busy Period Scene of Interior of St. Clair Motor Company's Garage Indicates Large Car Storage Space.

car account. I showed him a piece of adding machine tape on which I had footed up these items of free labor expended on the last thirty-four cars we had sold. The total was \$79.76, an average of \$2.34 for each car. Admitting that his labor charges were the same as mine, he had been overestimating his profit on each car by just \$2.34.

"All of these figures help, and the cost of compiling them by hand would be so great as to be prohibitive.

Easy to Balance Books.

"At the end of the month the Burroughs makes it wonderfully easy to balance the books. We use it to foot all our ledger columns. A person adding by hand is liable to make the same mistake the second time he foots a column of figures that he did the first. All we have to do now is check

back for errors in listing; the Burroughs mechanically performs the addition and we know the total is right.

"To add on this machine it is only necessary to depress keys representing the proper amounts, and pull the operating lever after each entry. Should a person depress a wrong key he can easily avoid a mistake by simply releasing this key and depressing the proper one. The machine automatically prints ciphers and punctuation wherever they are needed.

"When we pay a bill we check the extensions and foot them up on the Burroughs. In this way we have caught many errors and saved ourselves money. We pay these invoices by check and use the Burroughs to foot up the amounts on the stubs to know how much to credit the bank in the journal.

"We use the Burroughs, too, in taking inventory. We can now take an inventory of a \$3,000 stock of Ford parts in a day; the same work can't be done by hand in less than two days.

"Still another way we use the Burroughs is in making out bank deposit slips. This saves us time both in the office and at the bank.

Reduces Bookkeeping Expense.

"Our Bourroughs, in fact, is the only thing that keeps us from missing fire in our office and bookkeeping work. Its speed and accuracy have enabled us to so systematize our work that a girl with only an elementary knowledge of bookkeeping can handle it with ease. Only for the Burroughs we should certainly have to employ a high-priced bookkeeper—provided, of course, that we could get one."

Cash or Trade Acceptances for Bills

Methods of Settlement for Accounts and Rules for Handling These Matters Are Discussed by the Head of a Jobbing Concern Holding Membership in the Automotive Equipment Association in the Organization's Paper, *The Leader*

By A. S. Hatcher,

President, A. S. Hatcher Co., Macon, Georgia.

The most satisfactory settlement for an account is cash on or before discount period because a cash settlement is final and complete.

Next to a cash settlement is the trade acceptance (which is supposed to be a final and complete settlement) on account of the favor in which it is recognized by the Federal Reserve banks as the best type of negotiable paper covering mercantile transactions.

Notes are sometimes renewed, but trade acceptances are not supposed to be subject to renewal any more than one would expect a check of present date to later be substituted with a post-dated check.

My company had a request last week from one of its dealers that we let him give a renewal trade acceptance. We declined the request and tried to make it plain to our customer that when his trade acceptance was used by us it was considered a final and complete settlement of his indebtedness to us and was used like

so much money put in circulation. That same must be redeemed by him on the due date, the same as our government redeems greenbacks, and that he should borrow from his banker the money necessary to redeem his trade acceptance.

It is the writer's opinion that every jobber should make it a positive rule not to accept renewals of trade acceptances. The trade acceptance would lose its chief advantage if renewals were permitted. We make it plain to the customers of our company that if they fail to take the proper care of their trade acceptances that their paper loses its standing with the Federal Reserve district bank as well as ourselves and that their trade acceptances would in time be declined, just the same as bad money would be rejected for circulation.

The trade acceptance would stand no showing as compared with cash settlement unless the maker is made to understand that he has the same as passed out so much money when he passed his trade acceptance and that

he must protect his trade acceptance the same as the government does its money, otherwise the trade acceptance has no standing as compared with cash and would be more of a nuisance than a convenience in trade.

It is obvious that cash settlement is preferable to trade acceptance to the extent that there is a possibility of the trade acceptance not being a final or complete settlement, as the transaction is not complete until the trade acceptance is redeemed by its maker.

Rockville, Conn., May 15, 1919.
American Garage & Auto Dealer,
Chicago, Ill.

Gentlemen:—

I meant to send this check before but it slipped my mind. I hope it is not too late, as I would miss your paper very much. I hope you have continued my name for the paper.

Yours very truly,
P. J. DONEGAN,
23 Mountain Street,
Rockville, Conn.

Special Bodies Will Sell Rebuilt Cars

New Coachwork of Distinctive or Novel Design Can Be Utilized to Help Fill Gaps Caused by Difficulty of Obtaining New Passenger Automobiles of the Popular Makes for Which the Demand from Buyers Far Exceeds the Supply

By R. B. Johnston

Automotive tradesmen who depend on profits from sales of new passenger cars are leading strenuous lives these days. Most of them, especially the ones who represent any of the popular makes, spend a great deal of their time explaining to their customers how sorry they are that they cannot make deliveries or begging the factory sales managers by mail, telegraph, telephone or in person to please send some cars to them.

One of the methods used by a number of dealers to get something to sell to customers clamoring for automobiles is to rebuild and refinish used cars. In a great many cases dealers have one or more used cars on hand that are only a year or two old. When the mechanism of these vehicles has been overhauled and new parts or bearings supplied, if any are necessary, the power plants are practically as good as in any of the new models being produced this year and of which there is such a scant supply.

It is quite likely that the vast majority of men and women who want to buy new cars, and cannot get them, would not be interested in a rebuilt automobile if simply told about it, and had not seen the change that can be made in the appearance of a car that has seen one or two seasons of service.

See to Mechanism.

After having first made certain that the mechanical parts of the car are in perfect running condition the next step, and the most important one for the tradesman, is to either fix up the body that was on the car or to have an entirely new one built.

One of the ways to fix up a used car is to substitute a smart looking victoria top for the one that was fitted when the car was sent out by the manufacturer. When leather or some leather substitute is used as the material for the victoria top and the top itself is lined with some attractive material, which should also be used to

make slip covers for the seats, what had previously been a drug on the market becomes readily salable.

It is, of course, necessary to go over the finish and perhaps change the color before offering the vehicle for sale. Plate glass windows of striking shapes inserted in the sides and back of a victoria top will add to its attractiveness. Straight line fenders and new radiators are other ways to change the appearance of an old car. Another plan is to remove the running boards from each side and mount single steps just below each door.

Get New Coachwork.

Closed bodies of distinctive design, as well as touring or roadster bodies of a more individual or distinguished type than the kind turned out by the thousand, can be obtained from coach builders in large cities. In many districts it is not necessary even to go to a big city for a special body as there are many small carriage repair shops and tiny plants where truck bodies are made that can make fine looking passenger car bodies at a reasonable expense.

One dealer in a middle western city who has been very successful in keeping his cash register jingling from sales of rebuilt cars has found that it is a good plan not to paint the body until the car has been sold. This permits the customer to select the color for finishing the vehicle and thus the buyer is able to possess a car finished exactly according to his or her ideas. The dealer has no particular difficulty disposing of all the cars he can offer under these conditions.

In practically every city and town there are always a few men and women who are willing and able to pay for the delight of owning cars that are different in appearance from those owned by their friends and neighbors. When tradesmen are faced by the certainty that the number of new cars they will be able to obtain

from the factories will be far below the number which they could sell it will always be good business for them to try the rebuilding plan.

Dealers who have recently returned soldiers working for them will often be able to get very good and practical ideas as to special body designs if their former soldiers have been in France. With very few exceptions all of the bodies on European automobiles are what would be termed "special bodies" in this country. At least until the war started there were few if any plants in Great Britain or in other European countries that turned out bodies by the thousand all of one type as has been the custom in the United States.

Soldiers Can Help.

The European practice of having bodies made to order of course has resulted in a very wide variety of styles and shapes. While perhaps a good many of these foreign custom built bodies were very elaborate and high priced the automobile salesman or mechanic who was a member of the American army in France undoubtedly was able to gather a great many valuable ideas about reproducing some of these special bodies at prices which permit a good profit for the dealer.

WINTERROWD GARAGE, Orange, California.

5/17/19.

American Garage & Auto Dealer,
Chicago, Illinois.

Gentlemen:—

Your check for \$5.00 received and very much appreciated. I intend to earn another one very shortly.

Thanking you, I remain,

Very truly yours,

ARTHUR C. BROWN.

(Editor's Note.—We hope the above acknowledgment will cause other readers to send photographs and descriptions of good window displays to us for which we pay \$5 each.

Accounting for Automotive Dealers

Announcement Is Made of a Series of Articles on the Various Bookkeeping Problems Confronting Members of the Retail Trade—Readers Are Invited to Write Whenever They Need Advice or Counsel as to Matters of System

By J. Newton Boddy.

Manager System Department, Tanner, Gilman & Ellis, Chicago.

On opening an accounting and system department in the AMERICAN GARAGE AND AUTO DEALER, the one big thing we will try to keep in mind is to render real service to every subscriber—we will try to make the department a clearing house for ideas rather than a school for a fixed system of accounting. It is true that certain principles of bookkeeping are common to all business enterprises, but the aim of all bookkeeping is to so record business transactions that one's condition can be shown at any time with the least labor.

The simplest system is the best system—bookkeeping in its simplest definition is the recording of business transactions as they occur and when they occur, and the grouping of these transactions to show the effect they have collectively on one's present worth. This information should be available at regular periods and on short notice between periods.

From your books you should be able to obtain all the information vital in the successful conduct of your business, your purchases, your sales, your receipts and expenditures, a comparison of the business of one day with that of another, one period with another. They should show you what you owe and what is owed to you, the condition of your bank account.

With the help of a system you may determine quickly whether you are making a profit or losing money—it should show which branches of your business show the best profits and so guide you in the direction of your efforts. It should show the weak points so that they may be taken care of before showing a serious loss.

One big fault of the automotive dealer and garage owner in the past has been that he had little knowledge of business. Successful mechanics who had saved a little money thought they could do better on their own

day. To be successful, one must know his business—to do so, one must be able to get vital information from one's books or records—you can't keep it all in your head.

Good accounting methods is a road broad enough for anyone to travel on—the ditch one each side are too little system and too much system—one is just as bad as another.

Bookkeeping systems should be no more complicated than the business they take care of.

Garage and automotive sales business is not a complicated business. If one has the ability to operate this business successfully he certainly has the ability to understand the bookkeeping that should go with it.

In our department we are going to exchange ideas regarding bookkeeping methods that are in use among those we are acquainted with, subscribers to the AMERICAN GARAGE & AUTO DEALER. We will offer you an accounting system in successful operation today in scores of automotive establishments and garages in widely distributed areas. This system is flexible and can be modified to meet your individual requirements.

You may already have a good set of books. Maybe we can suggest some slight improvement in them. We wish to become your consulting accountants; this service is free to subscribers of the magazine. Ask us questions, give us problems to solve for you and we

Mr. Boddy is manager of the system department of Tanner, Gilman & Ellis, certified public accountants, and is a man of wide, practical experience in accounting for automotive tradesmen. He began his work in the automobile field in 1912 and has developed the system for automotive dealers ever since. In 1916, from April to September, Mr. Boddy traveled around through Kansas on a two ton Koehler truck. The vehicle was driven by one of the Koehler district men who was appointing dealers in small cities and towns. Mr. Boddy declares that the things he learned during this six months have been of the greatest value to him in his work.

Mr. Boddy has had a personal experience with the accounting problems of automotive dealers in cities and towns ranging from less than 1,000 inhabitants up to the State distributors in the big cities. He has installed systems for dealers selling the following cars: Buick, Dodge, Chevrolet, Cole, Ford, Hudson, Maxwell, Oakland, Oldsmobile, Overland, Paige, Reo, Saxon, Studebaker and White. He knows from actual experience the problems of dealers who handle passenger cars, trucks, tractors, accessories and used cars singly or in combination. He has also installed systems for implement dealers and hardware men who have been selling automotive vehicles or accessories.

Readers will get no theory to digest but plain every day horse sense. If your repair department does not pay we will try to find out why for you. If you show a fine book profit, but are hard put to meet current bills, find your bank balance small, and it is hard to "cash in" on book profits, we will try to find out the reason why and tell you. Maybe your book profits are, to a large extent, anticipated, unrealized or fictitious. We would like every subscriber who reads this article to write to us and tell us how it strikes him.

—American Garage & Auto Dealer, 116 So. Michigan Ave., Chicago.

than for someone else. Seventy-five per cent of these men had no business experience and were lucky to last eighteen months, many of them sinking their savings of years.

Competition is getting keener every

will give you our advice, or better still, have another subscriber answer your question. We wish to make this department a feature of the paper and ask you to help us in the matter. We will have a query and answer column

and will assure you of prompt service.

If you have an idea you think is good, let us have it and we will pass it on to the rest. We invite criticism and suggestions—let us all be from Missouri—show us. The trouble with most bookkeeping systems today is that it has been taken for granted that they would do because they sold. We would not advise any man to buy a set of books that he cannot understand.

A good many automotive dealers and garage men keep their own books, but even if one does not do so he should know them so thoroughly that he can get desired information independently of his bookkeeper. The fewer places one has to go for infor-

mation, the more easily it is obtained. We believe in centralizing information—in few books. The shortest method is almost invariably the best.

We hope to soon announce a manual on Automotive Dealer and Garage Accounting; this will include forms for use in a uniform system for garages and automotive sales agencies.

To intelligently handle inquiries regarding systems we must know:

How many sales accounts have you? How many purchase accounts? (How many firms do you buy from on credit?) How do you handle your expenses? How many branches in your business?

In fact, we cannot have too much

data—we do not know it all, and invite criticisms and suggestions.

In our uniform systems we have endeavored first of all to meet the needs of the average dealer, knowing that a standard system can be devised to meet his requirements only. It is not to be expected, however, that this system or any other will "run itself" or be of much service to those who are not willing and prepared to devote a little time, thought and study to it. To those who are willing to avail themselves of some system which will accurately show Profits and Losses and properly record assets and liabilities, we offer this system with the fullest confidence.

Pilfering Tools Drives Profits Away

Taking Accessories, Parts or Tools from Cars Being Repaired or Adjusted at Garages or Service Stations Keeps Customers from Returning—Best Plan Is to Make Inventory at Time Vehicle Is Left by Owner or Driver

By C. M. Adams

In appearance it was not an extraordinarily attractive pair of pliers. Even when new they had not been designed with beauty as a life work and he had used them so hard and so constantly that they were scratched and scarred. But he liked them. To show how much he liked them he always carried them in a place of honor, a little tool-bag slung at the bottom of the dash, along with his pet screw-driver and his favorite wrench ready to seize and sally forth against the motor when it became refractory.

On the first trip after he had taken the car off the jacks in the spring the transmission developed dry protesting growls and so he decided to stop at a garage in the nearby town through which he was passing, and have grease put in. A youth came out of the place and raised the floor boards to put in the lubricant.

The cap on the transmission case stuck, however, and he told the mechanic just to use those pliers instead of going in again. The youthful garage man did. He removed the cap and put in the grease, but when my friend was ten miles farther on his way he glanced down at the dash tool-bag only to discover that the pliers were missing.

"No, they weren't worth much," he

told me afterward. "I expect I can buy a new pair that's a lot better for a dollar or a dollar and a half and that's not enough to go back and kick up a row about. But, hang it, I liked those old pliers and I'll be darned if I'll ever stop at that place again. A bunch that'll carry off a banged up pair of pliers right before your eyes won't get any more of my business."

It would be interesting to know just how many times this sort of thing has happened—how many thousands of dollars of potential business profits have been lost by garage owners because some employe has pilfered a tool or an accessory from a patron's car. Having tools nonchalantly carried away as was the experience of my friend is somewhat rare but complaints concerning tools missing when cars are returned after a long stay in a repair shop are more numerous and the indignation resulting therefrom is costly. Yet, while efforts are made of course to put a stop to the practice by disciplining obviously dishonest mechanics, few garage men have made any systematic attempt to protect car owners from possible loss.

This should not be a matter of extreme difficulty; for an effective and simple check is possible. When a car is brought into a garage for repairs

which will necessitate a stay of some little time (overhauling the motor for example), tools and all equipment of value can be inventoried.

This need not require much time or trouble. A blank form can be prepared and printed containing a list of the usual pieces of equipment and tools found on a car and the items in each car can be checked off immediately after the vehicle is received. If the system of issuing a receipt for cars received for repair is in use this inventory form can be made a part of the receipt issued to the patron.

Such a plan offers a double protection to the garage man. Patrons are guaranteed against loss, and by this means he is assured of their good will. In addition a dishonest patron cannot come back at him with a claim for accessories which in fact were not on the car when received. Such protection, it seems, will more than pay for the time and stationery required to put the system into operation.

Of course such a plan will not bring about any marked reformation in the habits of a mechanic who has the desire to appropriate tools he fancies. Until human nature undergoes a profound change tools and accessories will probably continue to disappear from cars in garages despite all the

efforts of garage owners. But the inventory plan permits the wrath of an offended patron to be appeased, and the exchange of an inexpensive tool for good-will is always profitable.

Of course, none of this is intended to convey the impression that a car

owner need expect a garage man to take out a burglar insurance policy to protect his car while it is being repaired. Considering the value of the material worked upon and the opportunities for theft actual loss from this source is remarkably small.

But the thing will occur in the best of places and to forestall any possibility of a comeback from a suspicious or offended patron garage owners will find it profitable to consider the installation of some such checking system as that outlined in the foregoing.

Courtesy Wins Unexpected Car Sale

Salesman Treated Woman with Scarf Over Head Like a "Regular" Customer and When She Did Not Like Used Automobile of Kind She Asked for Showed the New Ones His Firm Handled—Sold Best Make to Her for Cash

By Lester G. Herbert

Everything in this story is strictly true except the names. For the best of reasons, these are fictitious, except the name of the city where the incident happened, which is Auburn, N. Y.

A certain automobile salesroom recently employed the services of a young man just returned from the war. He had had no experience selling cars, but he was a bright chap and anxious to make good.

One rainy morning a woman appeared in the salesroom, who plainly was of foreign, probably Italian, birth. She was characteristically dressed with a bright colored scarf about her head. She approached young Barker, the salesman, and asked to see a car of a certain make.

He was somewhat astonished that she should be interested in motor vehicles at all, but he replied courteously that his firm did not handle the make of car inquired for, but on second thought remarked that they had a second-hand one which had been taken in exchange.

She asked to see it, and was led to another department where these cars were stored. The would-be customer made no remarks but her face showed that she was not favorably impressed with the vehicle.

"Too old," was all she said,—
"wanta a new one."

Young Barker smiled at her brevity and said, "Let me show you something else, then," and the two returned to the front salesroom.

Here he showed her the lower priced of the two cars which the firm handled. The woman looked at it critically, walked around it several times, punched its upholstery with a

somewhat grimy finger, shook her head, and with an expressive shrug of the shoulders and outspreading of the hands remarked:

"No lika that, either!"

Young Barker was not sure whether to be impatient or amused, but determined to see the thing through, he said pleasantly:

"I'll show you the car you want. Just come this way," and he led her up to the most expensive automobile on the floor—a regular patrician.

For the first time the woman looked gratified. This was more the kind of car of which she had dreamed. She gave it a similar examination, and then asked crisply, "How much?"

The price quoted would have fazed many a pretentious individual, but the woman did not seem surprised.

"I taka that one," she responded with shining eyes. "No gotta enough monies with me today. Come back tomorrow."

"All right," young Barker returned, taking it for granted that this was simply a "stall," and that she had no intention of buying a car anyway.

He escorted her to the door, showed her out, and bid her a courteous "Good morning."

The next day he had almost forgotten the affair when the door opened and the same woman walked in. She advanced toward him and said, "I gotta money this time. Count him."

And sure enough, she put down a roll of bills big enough, as young Barker said, "to choke an elephant." He counted it out and found it right to the dollar. Then he turned to the woman and said: "Who'll run it?"

"My man. He worka. Come to-night and get it. He driva all right."

And sure enough, that evening she came in with Tony Marento, a somewhat timid man, in tow. But as soon as he got into the car, his joy over the new possession overcame him entirely, and he chattered volubly with her and the salesman.

This experience was something of an eye-opener to young Barker, for he had grown up to think of these people as different in likes and dislikes and buying ability. But a few weeks in the salesroom taught him differently, and he now declares that these people of the foreign population are hard-working, thrifty, and ambitious.

On account of his courtesy to her, several other patrons from the same neighborhood have come to him, and the young fellow's regret is that he doesn't understand the native language in which they talk among themselves, for he is sure that many times he could serve them better and win their friendship more readily, if not separated by differences of speech.

The automobile salesroom which is so located that it can cater to this class of trade, should not overlook it, for these people usually know what they want, and are ready to pay for it. With many of them, their one extravagance, so called, up to this time, has been a high-class musical instrument, such as a player piano, or an expensive music box.

To possess something of this kind, they were ready to sacrifice, and to work, oftentimes taking boarders and even washing and ironing. With the larger wages paid during war times, these newly-made Americans are reaching out a little farther, and many of them now own their own cars, and the ground is scarcely scratched.

EDITORIAL REMARKS

Self Protection Demands Support for Trade Body

Never before has there been so urgent a need of a powerful organization of dealers in this country. One of the reasons why a big dealers' body is needed is that only an association of great numerical strength, with consequent power and influence, stands any chance to prevent a number of unjust and oppressive laws, both national and state, from being enforced according to present interpretations. Not only are there several of these laws already on the statute books, but in addition a number of other unfair measures have been introduced in various States.

There is scarcely any doubt that it would be a simple task to obtain a repeal of a measure which imposes a double tax on most truck sales if all of the more than 30,000 retail automotive tradesmen were members of the National Automobile Dealers' Association. That body has a membership of more than 5,000 and its members are backing up the efforts of their officers and the National Automobile Chamber of Commerce to do away with the double tax on truck sales, but if all the retailers in the country belonged to the National dealers' organization the task of the officers would surely be far easier.

Another phase of the present situation regarding laws has developed recently in the South. This has to do with the enforcement of the "dry" laws in at least one state. It has been ruled that automobiles in which contraband liquor has been found are to be destroyed or else sold for the benefit of the government. In cases where automobiles that were seized had been sold on conditional bills of sales, and not fully paid for, the dealers who had disposed of these vehicles in good faith are faced by the possibility of losing all of the money still due to them. Efforts are being made to have this ruling modified, another proof that every tradesman should belong to the National retail trade association.

Many Former Soldiers Are Well Trained Mechanics

Automotive tradesmen can do a great deal toward solving the "jobs for soldiers" problem by employing some of these returned crusaders as mechanics in their repair shops. Many of the recent wearers of khaki have become expert repairmen during the months since this country entered the war, some of them having been trained while still in this country and others while serving in the Motor Transport Corps in France.

The training received by the former soldiers was very thorough, in the majority of cases. The men who did their fighting to make the world safe for democracy while serving as repairmen for army passenger cars,

trucks or tractors frequently worked harder, and for longer hours at a stretch, than they had ever done before. The need for thorough and rapid work taught many of them to do the tasks assigned to them in better and quicker ways than those which they had learned while working in automotive repairshops in peace times.

Those tradesmen whose establishments handle any work on trucks are almost certain to find that returned soldiers who have worked in army repair shops where trucks were fixed up will make the finest kind of employees. The men have not only learned how to get disabled commercial motor vehicles fixed up rapidly and thoroughly but they have also become accustomed to taking orders and carrying them out efficiently and cheerfully. The discipline to which they were subjected should make them especially valuable.

No New Cars?—Sell Rebuilt Ones

Dealers in most of the popular makes of passenger cars are having a great many more orders offered to them than they can possibly fill. Any dealer who is in this fix can care for at least some of these offered orders, provided he also conducts a repair shop. Even those prosperous motorists who wish to buy new cars of some of the higher priced makes will very often purchase used cars if the mechanism is in good condition, and the old bodies have been repainted or entirely new bodies of distinctive design and coloring have been mounted in place of the body that was part of the vehicle when it was originally sold. Some of the ways in which this is being done are described on another page.

One Who Wants to Sell

One of the big national weeklies recently stated "a typical man of enterprise is one who wants to sell" and every retail automotive tradesman should do his best to see that this description fits him. Practically everyone in the world has something to sell; whether it be merchandise, or service, or propaganda, or ideas, or ideals—even the clergyman who would succeed with his chosen profession must succeed in selling a belief in eternal salvation. There have been too many members of the retail end of the automotive industry, however, who have blocked their own progress because they did not appreciate the fact that they should sell more of their goods—whether cars, trucks, tractors, repairs, or storage—instead of assuming the attitude that customers must come to them anyway. No retail automotive establishment will be as successful as it might be unless the place is conducted in such a way that proves that the owner and his employees realize that they have something to sell and prove it by their courteous attention to regular customers and by making energetic efforts to attract new patrons.

Welding, Cutting and Brazing Practice

Description of Method to Prepare Broken Aluminum Gearcase, Having Inside or Body Fracture, for Welding by Preheating the Entire Casting to Proper Temperature Before Beginning to Apply the Torch—Hints on Finishing Job

By David Baxter

We have told how to weld crankcases with what I have termed an "outside break." One of which was an aluminum case and the other cast iron. (See April and May issues of this journal.)

Let us now take up those having an "inside break," wherein the fracture is located in the body of the casting. Or in other words, where the fracture is entirely surrounded by metal with no outlet for the reaction of expansion and contraction.

To put it in still another way, crankcases where the surrounding sections of the casting prevent the heated metal of the weld from expanding naturally; where the expansion cannot act along the direction of the plane, but must bow upward or downward, which usually results in a strain or crack. That is, if the welding is attempted without first heating the casting to cause the whole thing to expand.

The thing that prevents the casting from expanding usually prevents a natural contraction; a light section will cool first and pull away from the slower-cooling heavy section, resulting in a strain or open crack. Perhaps it will be clearer to state this differently, also; the light section cools and sets, then the heavy part cools and draws away from it. Both should heat and cool at once to be theoretically correct.

For the reasons just given, it is better to preheat aluminum crankcases or gearcases having an inside or body fracture, either in part or as a whole. Not only better but im-



Fig. 2—Showing Position, Welding and Covering of Job.

to heat this casting before applying the welding flame, as was done in this particular case. The casting was not, strictly speaking, a crankcase, but a gearcase, which is much the same thing so far as welding is concerned.

Let us take the welding process as it was accomplished in the instance illustrated herewith. By carefully following each step any welder should be able to repeat the success of the welder who did the work.

The job illustrated in Figure 1 was an aluminum gearcase to carry the transmission for a Studebaker automobile. The casting was in badly broken condition as shown by the picture. The metal thickness in the break was of an irregular dimension; the parts including the flanges, re-enforcing ribs, etc., being more than twice the thickness of the wall section, which made it a little more difficult to weld. It not only made more work in preparing and welding the job, but also increased the danger of unequal expansion and contraction. Figure 1 shows a welder holding up the broken section.

The work of getting the job ready consisted first of cleaning the break and an inch or so of its vicinity of all grease and dirt, then chamfering the edges both of



Fig. 1—Broken Gearcase.

perative in many instances; although sometimes they may be welded with only a preliminary warming.

It is difficult to distinguish between an inside and an outside fracture in some cases. If the fracture is entirely surrounded by metal it is safe to term it an inside one and to preheat before welding. Some fractures should be preheated, however, that are not surrounded by metal. And there are instances where it is not necessary to preheat even though the actual break is surrounded by the metal of the casting.

In the former class are included crankcases where the break extends over a goodly portion of the casting, even though one end or side of it is open; or in other words, where a large section of the casting has been broken out, taking part of the edge with it. Judging by this, one might call the casting in the illustration an "outside" job because part of the edge of the casting is included in the break.

It may be possible to weld it without preheating, but it is a doubtful proceeding. The careful welder will take precautions



Fig. 3—Welded Gearcase.

the casting and the broken part until when placed together the chamfering formed a V-groove as wide at the top as the thickness of the metal. This grooving was done, however, only where the metal thickness was over a quarter of an inch thick, viz., the ribs, flanges, etc. All grooving was to the bottom of the crack. After all the necessary chamfering had been done the broken section was fitted in place and the job placed on the welding table ready for preheating.

The Preheating.

To preheat the casting two common gas jets were lighted underneath it, slowly at first, then increasing the volume after a few minutes. This expands the casting slowly. The gas flame was regulated to envelop the entire lower half of the casting as it was placed on the table with the break upwards. Then the whole thing was covered with asbestos paper and allowed to heat until it would light a sulphur match at a touch.

Now aluminum has such a low melting point, and also has the peculiar habit of sagging and crumbling apart, that there is danger of carrying the preheating temperature too high. The welder should not allow it to get too hot; he should watch it closely, testing it from time to time, by tapping with a light piece of metal. As soon as it loses the metallic sound it should be welded.

Getting Ready.

While the job was heating the operator attended to the regulators, gauges, etc., selected the proper torch and fitted the correct size tip to it, estimated and selected several sticks of aluminum filler, replenished the flux receptacle. In fact, he placed everything in such shape that there would be no interruption once the welding started. One of the essential factors of welding is that the process be rapid and uninterrupted from start to finish.

Before applying the flame to the fracture the operator cut off the pressure of the preheating gas slightly; this because the heat of the welding flame tends to increase the heat of the casting by way of conduction. The flame was applied at a slight angle, not directly into the heart of the melting weld.

The Welding.

At the same time a small portion of the filler was melted and added to the melting groove or to the ungrooved part of the crack. Usually about an inch of the groove or crack was melted and fused with filler at a time. The first and succeeding inches of the fracture was puddled with the filler rod, by paddling and prodding the fluid metal with the side of the filler rod.

The patting was given a sort of rolling-pin motion toward the sides of the groove, the idea being to mix it with the filler and to squeeze out the oxide which forms on the surface of molten aluminum in a very short time after melting. It is this oxide that causes most of the poor welds; it will not allow the sides of the groove and the

filler metal to fuse until they are puddled together at the exact moment of melting.

The thinnest parts, which were not grooved, offered a slightly more difficult welding problem due to several things. First, there was more danger of getting the aluminum so hot it would sag or fall through to the inside of the case. It sometimes happens that a whole side of a casting will fall inward. Next, because it is a delicate operation to puddle aluminum a quarter of an inch or less in thickness. The pressure on the puddler must be light and the movement of it deft.

Some operators use only a rolling motion on thin work, or at least pat the metal piecewise. Others back up the weld with pieces of sheet iron. On the gearcase illustrated the operator employed the rolling or twisting motion with the filler rod as a puddler. This puddling may be done with a special puddler consisting of a flattened bit of iron rod.

Cloud Resumes Post as Advance Advertising Manager.

Kenneth G. Cloud, former advertising manager of the Advance Automobile Accessories Corp., 56 E. Randolph St., Chicago, resigned from the Touzalin Agency of that city May 15 to reassume duties as advertising manager of the Advance concern.



Advance Concern Gets K. G. Cloud Back as Publicity Director.

Mr. Cloud was identified with the Advance organization during its early days, and at that time directed its national campaign.

Advance's advertising is so big now and embraces so many different angles, that the officers of the Company deem it necessary to have their own advertising department. No change in policy is yet announced.

The welding started at a corner of the fracture farthest away from the flange and worked along the back side, then one end of the flange. The flame was then immediately swung back to the starting point and the weld was completed to the other end of the fracture. The entire weld was confined to as narrow space as possible along the crack, the idea being to prevent a loss of heat by conduction and to lessen the amount of oxide to overcome.

Figure 2 shows the welding process in progress. Notice the manner of holding the filler rod, also the diagonal position of the welding flame. This illustration also indicates the position of the casting on the welding table in regard to the gas burners used for preheating, and the horizontal welding position which facilitates the work. All of the welding was accomplished in this position without moving the job. The number of times a casting has to be moved has a great deal to do with successful welding of aluminum; the fewer number of times the job has to be moved the greater chance for a good weld.

Finishing the Weld.

Figure 3 shows the transmission case completely welded, ready for machining or "finishing." To do this a coarse rasp was employed on the sections where it was possible to do so. In the corners and around the flange it was necessary to use a chisel and the work was carefully handled.

Chisels used for this purpose should be drawn out thin and very sharp, as there is danger of breaking the casting if a blunt chisel is driven with a heavy hammer. All of the rough parts of the weld were cut away and made flush with the surrounding metal. A wire brush on an emery grinder gave a satiny appearance to the work.

After making certain that the inside was free of any projecting bits of metal, the gearcase was ready for service. A coat or two of aluminum paint adds much to the appearance of such jobs, but as I think I have said before, it often makes the customer suspicious that something is covered up. Besides it is not necessary if the weld has been properly executed.

Castings of the kind just described should be stripped of all loose parts, such as bushings, bolts and the like. A bushing screwed on the inside of the case is liable to be caught by contraction and shrunk so tightly in place that it is difficult to loosen it afterward. This should be done before preheating. The parts should not be replaced until the job is cold.

Care should be taken while welding through a machined surface to leave a little surplus metal in order that the casting can be machined level. Again let me repeat in closing that the weld should be uninterrupted once it is started. Don't stop for a bad spot, but complete the weld, then doctor the defect afterward, while the job is still hot.

Install a Curtis Air Compressor



The Curtis Sign

Illustrated above—is 10x14 inches—baked enamel on steel. Cannot be bought, but is furnished FREE with every CURTIS Garage Air Compressor—and cannot be had in any other way.

Display a CURTIS "FREE AIR" SIGN above your door—it inspires confidence and will help build your business. Motorists are looking for this familiar CURTIS slogan—because they know oil rots tires—and that a CURTIS Air Compressor furnishes AIR FREE FROM OIL, which means fewer blowouts, greater tire mileage and less repairs. The CURTIS is the ONLY Garage Air Compressor with the controlled splash oiling system that eliminates all danger of forcing oil into the air line.

CURTIS AIR FREE FROM OIL

Investigate the many exclusive features of CURTIS Garage Air Compressors. The line is complete—five sizes—stationary or portable. Just write your name and address on the margin of this advertisement—tear it out and send it to your jobber, or to us direct, for complete information and prices.

Curtis Pneumatic Machinery Co.
1515 Kienlen Ave., St. Louis, Mo.
Branch Office—530-U Hudson Terminal, New York City



You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

Price F. O. B. Factory \$10.00

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all ¾-ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Maxwell, Overland, and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.



Prices Not Coming Down, Says Kahn

Famous New York Banker Writes to Secretary of Labor Wilson Giving Reasons Why He Believes War-Made Level Must Continue for Many Years and May Even Go Higher During Temporary Periods—Collier's Expresses a Similar Opinion

Whether or not prices will come down in the near future has been one of the greatest problems confronting retail automotive tradesmen of all kinds since the war practically ended with the signing of the armistice last November.

Retailers of passenger cars and commercial motor vehicles have been asked repeatedly by prospective buyers during the last few months when the prices of cars and trucks would come down. In many instances, it has not been possible for the automotive tradesman to make even an accurate guess and because of this many sales of vehicles have not been made.

At least one big New York banker—Otto H. Kahn, of Kuhn, Loeb and Company—does not believe that prices are to be lowered in the near future. He has outlined his views on the subject in a communication to Secretary Wilson of the United States Department of Labor at Washington.

Mr. Kahn is convinced that there will not be any material lowering of prices for a number of years, if ever, and declares that, for all practical purposes, the war was responsible for the institution of a new level of prices and created a condition in this regard that cannot be ignored. In addressing Secretary Wilson Mr. Kahn wrote:

Factors of Prices.

"Prices are determined in the main by the volume of production, of consumption and—probably more than by either of these—of the circulating medium; that is, currency, bank credits, etc.

"1—Production. After the Civil War, the return of prices to the pre-war level, though it took thirteen years to accomplish, was immensely aided by the development of entirely novel methods of production in the shape of new forms of machinery and new kinds of business organizations. No one will seriously contend that the possibilities of the immediate future for increased efficiency or novel meth-

ods in production and distribution are likely even to approach those which came between 1865 and 1890.

"2—Consumption. In view of the vast destruction wrought by the war and now to be made good by reconstruction, and in view of the accumulation of the demand for many things which could not be supplied during the war, demand in many fundamental lines is bound to be large and urgent for some time to come.

"3—Circulating medium. The credit expansion and currency inflation of the leading countries of the world, including our own, during the past five years has been on an entirely unprecedented scale. The process of contraction and deflation, to the extent that is possible and likely to be approved by public opinion, will take many years.

No Quick Recession.

"The conclusion is inevitable, that we have arrived at a new price level, this level in the early future may go somewhat lower, or it may go somewhat higher than at present, but it seems to me that there cannot be any immediate and radical recession. Those who hope for or fear material lower prices will, I am convinced, have to wait a long time."

Another view of the subject, which agrees with that of Mr. Kahn, was given in a recent *Colliers'* editorial headed "As to Prices" reading as follows:

"The war period made higher prices because goods were used and destroyed on a huge scale, and because government money was pumped into business on a scale even huger. We have all moaned over the new level of prices until its reduction seems the one desirable thing. But is it?

"Business runs on present prices and on the hope of future prices: to have them going lower is not attractive except to the consumer. The bargain hunter is an interesting figure in modern business, but he does not, as a rule, start anything.

"The typical man of enterprise is one who wants to sell. While the consumer is trying to make up his mind as to prices, business lags. Passing from war work back into full-power peace work depends largely upon accepting and maintaining present prices until they can be lowered by more effective production. Government can help by withdrawing war-inflation currency as fast as the sound demand for money will permit.

"Recent controversies between Federal officials as to what steel ought to sell for simply show that some of the men at Washington do not understand the problems they have helped to set. They had much better be fussing over the absolute necessity of getting business going. People everywhere need things to use; money is only the device by which they hire themselves to make those things. The essential is to have the hiring go on."

Au-To Air Compressors Have No Complicated Parts.

It is claimed by the makers that the Au-To air compressor is free from complicated mechanical parts, and therefore practically fool proof. The concern especially emphasizes the fact that the oiling system of this device keeps the oil at a constant level in the crankcase as long as there is any oil in the reservoir. The glass gauge, which is set securely in the housing for the lubricant where it cannot be broken, indicates at all times the exact level of the lubricant.

Each Au-To air compressor is thoroughly tested under 300 pounds compression before it is pronounced ready for shipment. It is built by expert machinists of the best materials obtainable. The moving parts have an ample margin of strength to withstand exceptional strains. The cylinder is made of special carbon cast iron.

The Twin O compressor consists of two units mounted on a heavy cast iron base, and connected together. It is equipped with a tight and loose pulley, and two fly wheels to maintain a perfect balance. Full particulars and trade prices can be obtained by writing to the Au-To Compressor Co., Wilmington, Ohio, and mentioning the American Garage & Auto Dealer.

When Springs Break

put on

VULCAN
QUALITY
VULCAN
The Replacement Spring

A Dealer Writes:

"Pardon me for informing you of the Splendid Success I have made since becoming a VULCAN Dealer."

Spring Service for a Nation

as rendered by VULCAN has made over 7000 Dealers equally as successful.

VULCAN Service
combines

Quality—Demand and Profit

Write for Particulars

regarding the VULCAN proposition and the FREE Display Rack with first order.

Jenkins VULCAN Spring Co.

Factory

Richmond, Indiana
Direct Factory Branches
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Boston, Mass. Reading, Pa.
Dallas, Tex. St. Louis, Mo.
Sumter, S. C.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Electric Signs Hold Accessory Trade

Automotive Dealers and Garage Owners Advised to Make Best Use of the Electric Lighted Sign to Bring Users of Automobile Accessories, as Well as Transient Customers, Into Their Establishments to Buy Goods

By Arthur W. Park

How about the accessory trade?

Are the garage owners and automotive dealers going to permit this lucrative and important branch of their business to get away from them?

These are questions which vitally concern every reader of *The American Garage & Auto Dealer*. They are questions which are being weighed and considered by dealers individually everywhere and which will be seriously pondered at the various meetings to be held during the coming summer.

I think it is apparent to every dealer that some vigorous effort must be made to stop the trend of the accessory business away from its natural home—the garage. The writer feels confident that every one of his readers has recognized the tendency and has deplored it and is willing to take measures to stop it.

That granted, there is only one answer to the puzzling questions:

"Better sales methods and more effective advertising."

Advertising may mean many things. There are scores of mediums which are at the disposal of the automotive dealer and the garage man. This article, however, deals with only one kind—electric sign advertising.

This field, up to the present time, has not been thoroughly explored by the garage owner. A day's drive through any section of the United States will locate scores of garages and automotive establishments with painted signs, but it will be found that the tradesmen operating attractive electric signs will be fewer.

It is a fact, however, and an important fact from the automotive dealer's point of view, that the tradesmen who do operate electric signs are the larger, more prosperous and generally more progressive dealers.

Signs Work Long Hours.

The fact that the importance of electric sign advertising has not been fully appreciated by garage men and automotive dealers is considered unusual by advertising men. It seems to them to be one of the most attractive and effective methods at the disposal of the automotive tradesman. Electric signs are seen to be particularly valuable when it is remembered that garages are open, generally, 18 hours of the 24, and that a sign, to be 100 per cent efficient, must work for them by night as well as by day, 365 days in the year. Hundreds of glistening electric signs, many of them porcelain enameled and attractively finished, are being hung above garages and

other automotive establishments every day.

But to get back to accessories. In the past, the garage man and the automotive dealer has considered the accessory business solely as a side line. His business was primarily to sell and repair cars and to store them. He gave his first attention to that line and let the accessories sell themselves or become shop-worn on his shelves. Insufficient attention was paid to renewal of stock with the result that it frequently was necessary to turn away customers because the supply of the desired article had been exhausted.

I think this condition has been responsible more than any other thing for the present tendency of the accessory trade away from the garage and automotive establishment to the hardware and other stores.

In considering a remedy, the first step to be taken is to see to it that the stock on hand is complete. Then comes sales effort. Teach your employees to suggest new sparkplugs, extra tubes, etc., to your regular customers. See to it that your showcase and window displays are attractive and you will find little difficulty in disposing of your stock and making your "side line" pay dividends at the end of the year.

Reach New Business.

So much for the regular trade. But how to reach new business and the transients? Much of that already has turned away from the dealer's door and must be coaxed back.

And that is where electric sign advertising applies.

There is probably no more potent agent for the attraction of trade than an electric sign. The value of advertising mediums is determined largely by circulation and probably no other medium has a circulation which equals that of an attractive sign above your door.

Every automobile owner passing your garage is a prospective customer. If there is a sign to attract him he stops; if there is none he goes right on until he does reach a sign. Granted that you have a sign which will cause the prospect to stop, it is up to you or your employee to make the sale.

The sign has served its function by bringing a customer to your front door. It is now up to you to sell him. If your stock is worthy and of good quality that customer will come back and it is a fundamental principle of business that the satisfied customer is the best advertisement.

Get a good sign of an approved model.

Advertise accessories. Teach your employees to push profitable lines. Utilize an attractive, durable electric sign to call customers to your door; sell them worthy goods and watch them come back!

In the last analysis the automotive dealer is the logical agent for the merchandising of automobile accessories. It is in his line. But, if he neglects his opportunities and his sales curve drops, it is to be expected that the manufacturers of the various specialties and accessories will search for other channels through which to market their products.

Competition Is Keen.

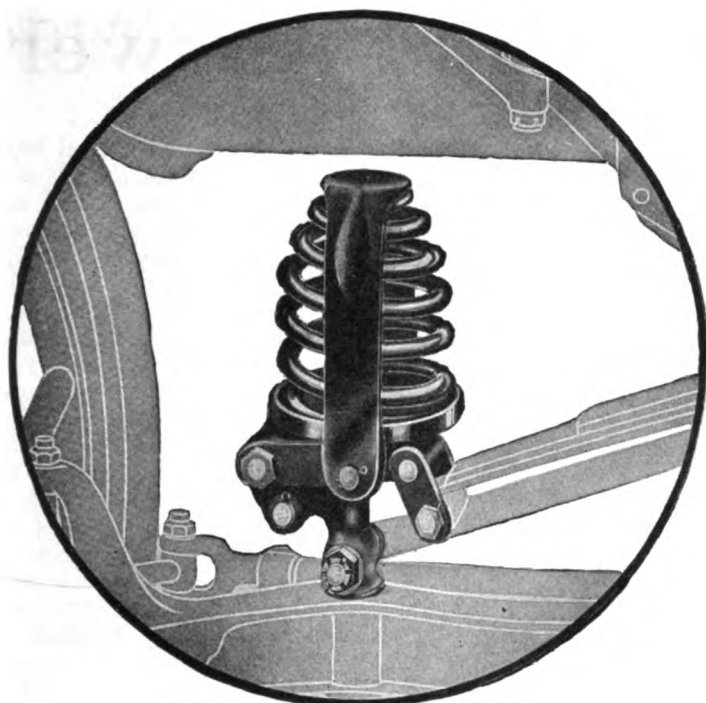
A postwar season of prosperity already is making itself felt. But if business is brisk, competition is also keen. As long as automobiles are sold there will be a market for accessories. And if the garage and automotive dealers fail to provide the trade with these accessories and fail to inform the public through judicious use of the electric sign, that they have the accessories to sell, someone else will.

If the automotive dealer is to sell accessories he must push his line—by salesmanship and by the best methods of advertising. And in the electric sign he finds a medium and a method which not only sells the goods he wishes to sell but in addition improves the appearance of his place of business, widens his zone of influence, makes his establishment dominate other places less attractively advertised and reaches the greatest number of people by working 24 hours a day seven days a week for a daily cost of only a few cents.

"Light your sign" is one of the slogans urged upon businessmen by Roger W. Babson, the famous industrial analyst, who has been engaged by the government to help American business men over the depression of the reconstruction period and to promote after-the-war prosperity.

And the same slogan adopted by every garage man and automotive dealer in the United States will have the effect not only of increasing his general prosperity, but will hold under his control, business naturally his, but which has been slowly but surely slipping away from him.

Remember, if YOU do not attend to the business for which you are individually responsible, you cannot expect anyone else to do it for you. Loyalty is as praiseworthy in a business concern as it is in a nation's affairs.



FRONT VIEW

The
**SHOCK
 ABSORBER**
 that eliminates
 Recoil
 by removing the
 Cause

HALLADAY

Direct Suspension Shock Absorber

The driver of a Halladay equipped Ford car is never troubled with being bounced up by the rebound after hitting an obstruction or dropping into a hole, for rebound never happens.

The great range and lightning action of the Halladay "bee hive" springs takes up the rebound before it can reach the leaf spring.

Make your car ride smoothly and last longer. Save money on tires and gas. Travel the roughest roads in comfort. Equip with Halladay Direct Suspension Shock Absorbers.

Made and guaranteed by men who know.

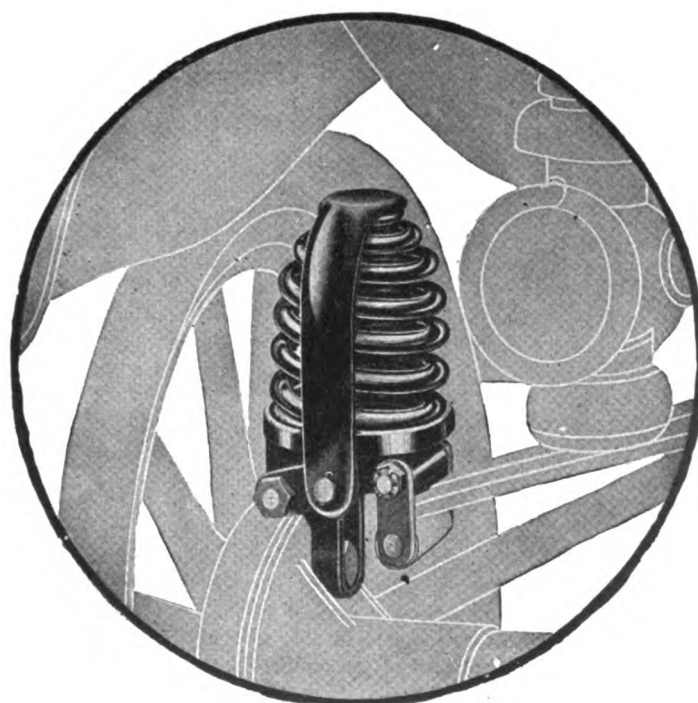
Write for descriptive circulars.

L. P. HALLADAY CO.

Manufacturers of
 Bumpers, Shock Absorbers and Automobile Accessories

370-380 Broadway

Streator, Illinois



REAR VIEW

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Readers' Questions and Answers

By G. L. Shelley

Garage Building

Question: My home is in a very small town where there is no garage and I have been more or less successful in doing automobile repair work at home and at the homes of automobile owners in town and in the surrounding country. Am located in a successful farming community, and having managed to save a nice little sum of money from my efforts, am anxious to build a small garage and shop of my own and would thank you to publish in the next AMERICAN GARAGE AND AUTO DEALER any ideas you may have that would help me to get started right.—R. S., Iowa.

Answer: For a town of 3,000 inhabitants, or one of less population but located, as you say, in a good farming community, we might suggest a one-story brick or cement block, with a 50-foot frontage and 120 feet deep. The arrangement should be so as to permit of an office in the front-center with a door on each side, allowing cars to enter at one door and leave through the other, thereby avoiding congestion.

Do not use posts, but trusses for support of the roof, which permits of much more working space and avoidance of accidents to fenders, lamps, etc. The front 80 by 50 feet should be devoted to storeroom, with stockroom and wash-rack at center and immediately back of the office. The rear 40 by 50 feet should be set off for repair shop in which should be a wash-room and lockers along partition between storeroom in front and repair shop in rear.

There should also be installed a generator, drill press, lathe, work bench, vulcanizing room, with a second work bench if desired, also coal bin and heating apparatus, which can supply heat through coils throughout the building. All of the above mentioned should be arranged along the outside walls, a 12-foot door in partition between the two large rooms, preferably at one end, through which cars can pass into the repair shop.

Be sure there is plenty of light and air in the office and repair shop. For the accommodation of your patrons a limited supply of accessories, tires, ignition sundries, etc., should be kept on hand in the stockroom. Repair shop fixtures should consist of shelves and racks for tools on the walls at back of bench; a set of stout drawers for keeping bolts, nuts, etc., some of which should be kept under lock, as tools have a way of disappearing. With the above equipment you should be able to make a very safe start, and future requirements will be suggested to you as you progress in your business.

Motor Car Bearings

Question: In what parts of motor cars and trucks are anti-friction bearings used, and what are the different kinds of bearings best adapted to varying conditions of service?—B. C., Ill.

Answer: While the majority of motor cars and motor trucks contain three kinds of bearings—ball bearings, flexible roller bearings and tapered roller bearings, there are really five different classifications: annular ball bearings, cup-and-cone bearings, straight roller bearings, flexible roller bearings and tapered roller bearings.

There are several makes of ball and roller bearings on the market, but only one kind of flexible roller bearing, the Hyatt. The Timken tapered bearing is also a distinct type. Anti-friction bearings are

10 miles per hour, with the lights off, the indicator should read "charge"; it should also show a charge when running at 20 miles per hour with the lights on, otherwise the trouble is doubtless in the generator. If at the proper time the indicator does not show "charge," the commutator will be found dirty or rough, and should be cleaned with 00 sandpaper. Emery cloth should not be used for this purpose.

Place a piece of the sandpaper on the commutator and allow the engine to run, pressing down on the paper until the commutator takes on a bright appearance, then clean off with a dry cloth. Then clean the commutator brushes by rubbing with a soft brush the surface which comes in contact with the commutator. As long as the commutator is smooth and clean there will be no difficulty from the brushes not wearing evenly and smoothly.

* * *

Repair-Shop Pit.

Question: I wish to install in my garage a pit for use in repairing cars. Can you tell me how to go about it, something as to specifications necessary, etc.?—G. O., Kansas.

Answer: The repair pit should be constructed of concrete. Ledges are provided at different heights and boards placed across, giving the mechanic plenty of room for accomplishing his work. By providing a wooden floor with a space beneath there is less chance for dampness to collect. Aside from the board used for the mechanic's seat, several of the boards may be left in place across some of the upper ledges, thereby affording a shelf for tools and for steps in getting into and out of the pit.

Buick Axle Adjustment

Question: One of my customers has twice brought his Buick car to my garage for repair, and I seem to have considerable trouble in locating and correcting the fault in a permanent way.

There is noticeable a peculiar click when letting the clutch in or changing gears. Any suggestion you may publish in an early issue of the AMERICAN GARAGE AND AUTO DEALER, which will help me out of the difficulty, will be appreciated.—J. D. L., Penn.

Answer: The trouble you find is undoubtedly due to slack in the driving system, and an adjustment will be necessary to stop the annoyance.

To make sure that looseness is present, we would suggest that you jack up one wheel and rock it back and forth with gears locked in high. A two-inch travel, marked on the tire, is quite all right.

SEND QUESTIONS

Develop inquisitiveness! The more you know about your business the more money you can make. Inquisitiveness means asking questions; the more you ask the better we are pleased.

All readers are invited to write to us when they wish information on automotive subjects. We welcome queries about cars, trucks, tractors, trailers, tires, or anything and everything sold or used by automotive tradesmen and their employees. When a quick answer is desired we will send a reply by mail, otherwise the answer will be printed in this department. Whether you are a dealer, a salesman, a mechanic, a bookkeeper, a service man or a stock-keeper, do not hesitate to send your question in and it will be answered.

—American Garage & Auto Dealer, 116 S. Michigan Ave., Chicago, Ill.

more absolutely essential in the up-to-date motor car, truck or tractor than in any other machinery, and are indispensable in such parts as the transmission, front and rear wheel hubs, the points where the axle shafts enter the differential, and both ends of the pinion shaft, as well as the worm.

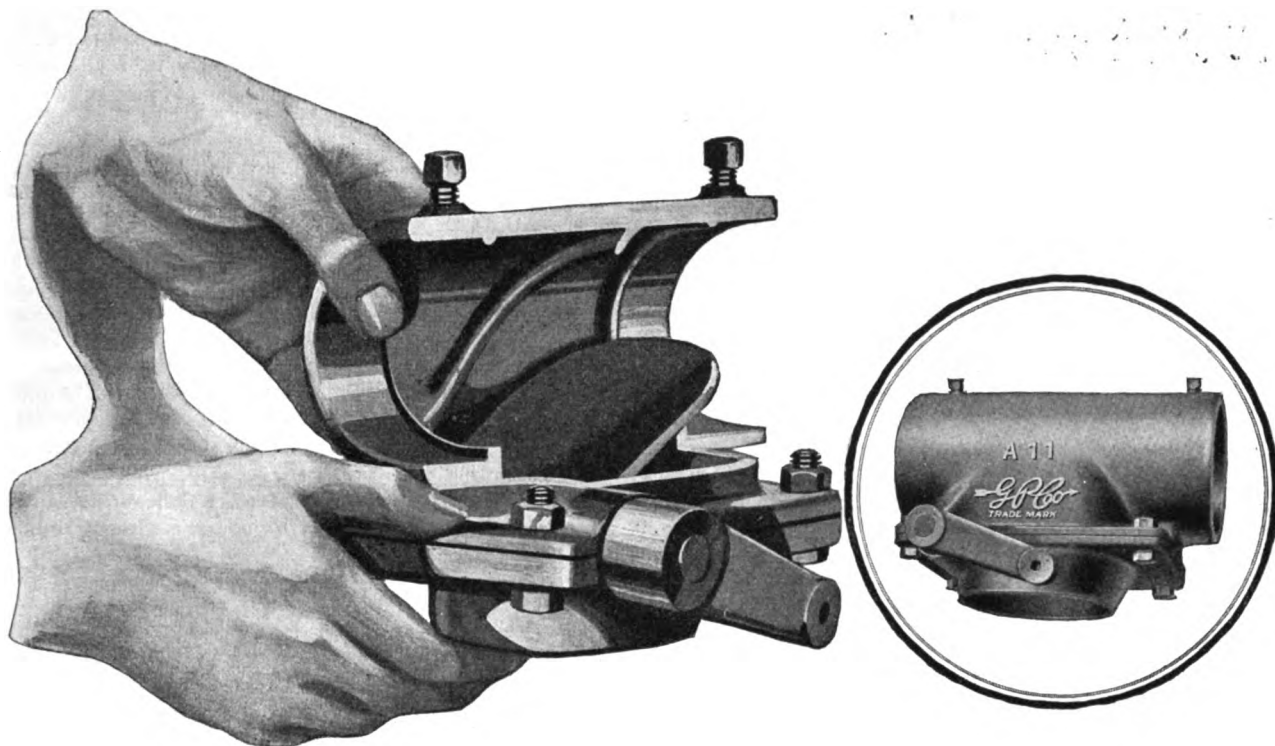
Anti-friction bearings are also used in the fan shaft, the clutch and starting motor and steering gear. These parts are, however, of minor consideration, as the bearings do not actually work under the shocks, loads and other unfavorable conditions.

* * *

Generator Trouble

Question: When going at 20 miles an hour with the lights on the battery gauge shows a discharge, while below that speed and without lights the generator works all right, where can the trouble be located?—A. J. B., Colorado.

Answer: When running more than



Is your motor cheating?

Do you know your motor's secrets?

CAN you tell when you are wasting power? How do you know all your cylinders are doing their full work? You may be wasting power and not know it—that means wasting gas and money.

There is only one efficient way to tell just how healthy your motor is. Put a G-Piel Muffler Cut-Out on your car.

The G-Piel Muffler Cut-Out will tell your motor's secrets. It is designed so that the carbon deposits cannot form and cause it to leak. Gases exhaust fully with no possibility of back pressure.

Sales Department

EDWARD A. CASSIDY CO., Inc.
Madison Ave. at 40th St., New York City
Manufacturers: THE G. PIEL CO., Inc.

The G-Piel Muffler Cut-Out

PIEL PRODUCT

"Tells the motor's secrets"

though a greater amount will require an adjustment.

Should you determine that a bevel ring adjustment is all that may be necessary, remove the rear axle cover, take off the collar locks, when the whole differential assembly may be shifted to the right or left, as required. If, however, more than this is found to be necessary, it is advisable to take down the entire rear axle, clean the parts thoroughly and make the necessary adjustment when the parts are out and in plain view of the mechanic.

The proper method of removing the Buick axle is to raise the car from axle by means of an overhead hoist, sufficiently high that the driveshafts will bind when removing. An advisable precaution is to place blocks under the runningboards to prevent injury should the hoist give way.

Then disconnect brake rods after removing the front floor-boards; remove saddles holding vertical bearings on driving yoke ring at rear of transmission; unscrew brass packing collar of universal joint; disconnect rear springs from their axle supports; alternately raise and lower the car until driveshaft slips from universal, then slide assembly out to the rear.

Be very careful that the torque tube does not drop to the floor, to prevent which allow it to rest on a horse, at the same time placing the axle across two horses; remove hub cap if necessary, also flange stud nuts; draw driveshaft out with driving flange attached; remove radius rods where connected to torque tube; remove nuts holding main driveshaft housing to rear axle housing; pull torque tube forward and remove it from axle housing.

You will note the differential is connected to this housing and comes out with it, then place the assembly in a vise, thereby enabling the operator to properly take care of the parts.

* * *

Oil Transfer System

Question: Will you kindly publish a system whereby oil can be transferred from the barrel to the storage can?—H. M. A., Ohio.

Answer: A very good means of transfer can be contrived with the aid of a differential pulley and grab-hooks. Fasten the pulley to the ceiling beams directly over the oil storage-room doorway, and by mounting the cans on caster platforms they can be easily rolled under the suspended barrel, a hole drilled in the bung and oil transferred without trouble.

Gray-Heath Company Holds Sales Meeting in Chicago.

The Gray-Heath Co., 1440 S. Michigan avenue, Chicago, held its semi-annual general sales meeting Wednesday evening, May 14, at the Hardware Club, Chicago. Twice a year the Gray-Heath Co. extends an opportunity to its entire traveling sales force to come to Chicago for the privilege of exchanging ideas, discussing new methods for obtaining business, and for "ginger up" purposes. Consequently, these meetings are enthusiastically attended, with a free participation by everybody in the discussions.

The Gray-Heath Co. has done remarkably well since its inception in 1913, and, in order to take care of its increasing business, announced that its capital stock was to be increased from \$100,000 to \$250,000, all of which increase in capital stock would

be absorbed by present officers and employees.

Members of the automotive and hardware trade press were privileged guests and made interesting talks on sales conditions.

Frederick B. Hart, who has been advertising counselor for the Gray-Heath Co. for years, made some very appropriate remarks on the advisability of concentrating attention and study on specialties. Mr. Hart very pertinently showed why the best results could be obtained if the sales force thoroughly knew the products which they were selling.

The Gray-Heath Co. has a very interesting sales plan which includes the use of missionary men and field managers, as well as a school conducted at Chicago to teach new men the methods successfully used by the Gray-Heath company. The success of Gray-Heath Co. is reflected by the results it has accomplished.

The officers and salesmen of the Gray-Heath Co. who were present at this semi-annual dinner included: Mark W. Heath, John P. Schott, Roy Knights, B. L. Gray, O. S. Mitchell, S. H. Houser, H. A. Tate, J. J. Sullivan, V. H. Alexander, J. H. Williford, H. J. Kohr, Chas. Hofman, R. C. Wolford, A. L. Mitchell, E. J. Tighe and F. W. Nettleton.

New Era Specialty Plant Has "Fortunate" Fires.

Smalley Daniels of the New Era Spring & Specialty Company claims that the fires which recently damaged the spring factory—twice in the last month—were "fortunate fires." In the first fire one of the workmen was so badly burned that he afterward died. In the second fire a considerable amount of damage was done in the spring department. But in spite of all this, production has not been interfered with materially.

Such a large demand is being made for "better" springs, bumpers, and tire carriers, that the factory production capacity is overtaxed and the workmen have scarcely room to work. In view of this congested condition at the plant, it is remarkable that not more people were hurt—and it is indeed a "fortunate fire" that can get a start and do actual damage, without stopping production.

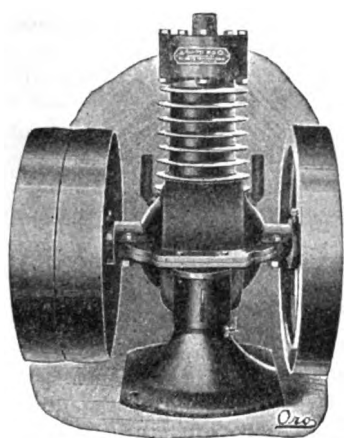
The individual who thinks he can always conduct his business in the same old way will soon get into a rut. And a rut wears itself deep enough in a short time that it will form a subway in which mere routine workers are buried. Don't travel in a rut! Post war time conditions demand readjustment and conservation. Conservation may mean expansion. It is the true saving of materials and opportunity.



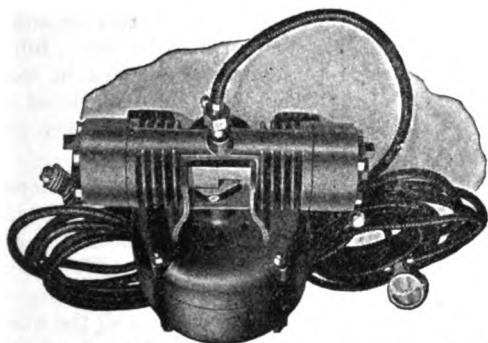
Officers and salesmen of the Gray-Heath Co. (reading from right to left): Mark W. Heath, John P. Schott, Roy Knights, B. L. Gray, O. S. Mitchell, S. H. Houser, H. A. Tate, J. J. Sullivan, V. H. Alexander, J. H. Williford, H. J. Kohr, Chas. Hofman, R. C. Wolford, A. L. Mitchell, E. J. Tighe and F. W. Nettleton.

Oro
GOOD as GOLD

The Long-Lived Connecting Rod for Ford's



AU-TO AIR COMPRESSOR No. O



Electric Driven AU-TO Air Compressor No. 10

EVERY Ford that leaves your shop with one or more Oro Connecting Rods installed means that you have satisfied another customer—made another friend.

Hundreds of thousands of Oro Connecting Rods have made good because long service is built into them. There is no danger that they will let go and smash up a motor—and with it your reputation as a reliable repair man. The steel is the best obtainable—30 to 40 point carbon drop forged. The babbitt is a scientific combination requiring the minimum amount of lubrication and giving the maximum amount of wear.

You may be able to get a connecting rod a few cents cheaper—but does it pay? You make a reasonable profit on Oro and the replacement lasts for the life of the car—a constant reminder of your good work.

You build your business on a sound foundation when you use material like this. Your customers send their friends. Your business and your profits grow.

We are the manufacturers of the No. O AU-TO Air Compressor which is so well and favorably known. In ten years we have never made a charge for repairs on one of these machines. In common with our other types of AU-TO Air Compressors, they work perfectly year in and year out.

Be sure to ask your jobber for Oro. He probably carries these rods, but if he does not, write us.

AU-TO COMPRESSOR CO.
 WILMINGTON, OHIO



How to Make the Shop Profitable

Part of Each Month's Profits Put into Employees' Bonus Fund that Was Distributed at Christmas to Men Who Had Been Working at Least Six Months—Adjustment Claims Simplified by Visiting Makers and Jobbers

By E. B. Hinrichsen

A balance was struck every thirty days in all departments. There was capital enough to take advantage of all discounts to be obtained by paying cash or its equivalent. Claims for defective parts and supplies returned to the jobbers or manufacturers were carefully gone over and those which seemed at all doubtful were not considered as assets.

The results of each thirty days were compared with the preceding month and leaks looked for. In addition to this, each department head wrote up a story of his month's business, telling in detail just why he made certain deals and what he had learned from them.

If a deal was bad and he did not see it any one was at liberty to point out where he had gone wrong. This was always done informally and in a spirit of good fellowship. Mr. Brown, however, made it very plain that it was better to make mistakes occasionally than to get in a rut and never try any improvements.

The thirty-day profits, if there were any, were kept in a separate account. A certain percentage went for dividends, a certain portion for depreciation not covered by general expense, a certain part to a surplus account and the balance to the employees' bonus fund. At the end of a year this fund was distributed.

The amounts paid out from the bonus fund were based on the salaries and wages paid during the preceding six months. No bonus was paid to an employee who had not been with the firm for at least six months. This bonus was distributed just before Christmas, a most welcome time for most people.

The parts and supply business caused some confusion for a few months. They soon had a great mass of claims piled up against the jobbers and manufacturers and the settling of them was a slow process. It also tied up ready money, as they paid cash and had early adopted the policy of making adjustments with the customers and

later getting their adjustments from the original suppliers.

The salesmen who sold them the goods gave them every assurance that their adjustments with customers would be accepted if good judgment were used, but in many cases their firms were slow in backing them up. The claims on parts had to be made through the local automobile agencies. Arrangements were made to carry on this correspondence in the names of the various dealers, but some of them had put in bad claims before and the suppliers, whether manufacturers or jobbers, did not understand the new working arrangements.

Bill Takes a Trip.

At the suggestion of Mr. Brown, Bill made a trip, visiting all the concerns with whom they did business. When they talked it over before he left, Mr. Brown told him to explain fully what they were doing. Except for that he gave him no instructions, wisely judging that Bill's methods were probably better than any he could suggest.

Bill devised a plan of his own which worked out well. He would first see the biggest man in the organization and would tell his story in his own way. Bill had a good personality and talked in words of one syllable. Then, too, he believed in what he was doing and thought every one else should at least be interested.

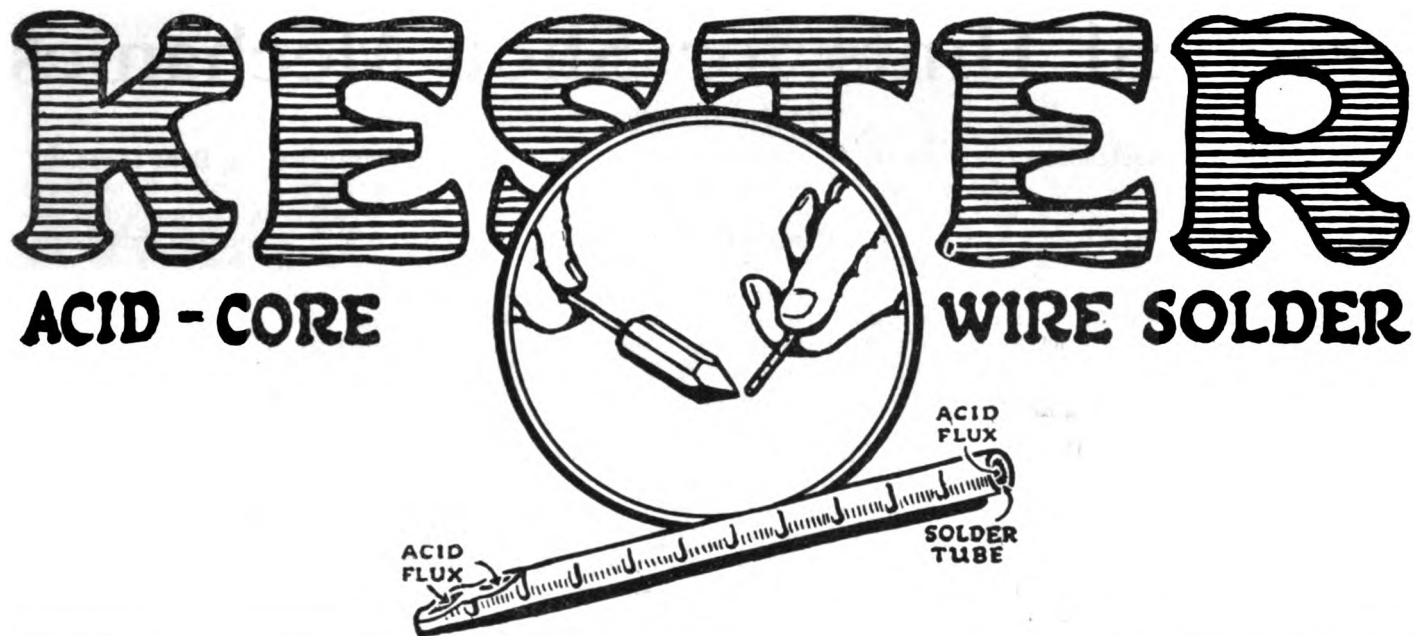
Most organization heads were interested. The idea was new. After they got through with Bill they would turn him over to the proper department head with instructions to take care of him. From this department head Bill would go all the way down the line until he met the man who hauled his goods to the freight house. He made it a point to meet and talk to every one. He knew something about each one's work and did his best to find out more.

Bill kept a record of every person he met and just what his place in the factory or jobbing organization was and what his duties were. He also jotted down what he thought the man's characteristics were. He talked long enough with each one to be sure that the person would remember him.

It was Bill's plan to send a personal letter to the right man at the right time when it would do the most good. After his return there was a great improvement and the parts men would come to him as soon as there was any trouble. Bill would shoot in a letter to the proper man and it would usually straighten out the tangle immediately.



The business of the H. G. Paro Co., 1412-1414 S. Michigan Ave., Chicago, has expanded to such an extent that it was found necessary to increase the office and showroom capacity. By removing from the second floor to the street floor; motorists, garagemen, repairmen and dealers find it very easy to call where they will find a complete line of Paro garage equipment exhibited. The Paro company specializes on the Ekern line, which includes portable garage grease guns, emergency axles, portable work benches, motor stands, etc. Though Model N portable grease gun was put on the market very recently the demand for it has already exceeded the expectations of the Paro executives.



Makes easy work of soldering

The all-around Garage Helper

The factor that makes soldering jobs on a motor car so difficult is the hard-to-get-at parts that need to be soldered. The toughest part of the job is applying the soldering flux to those parts that are hard to reach.

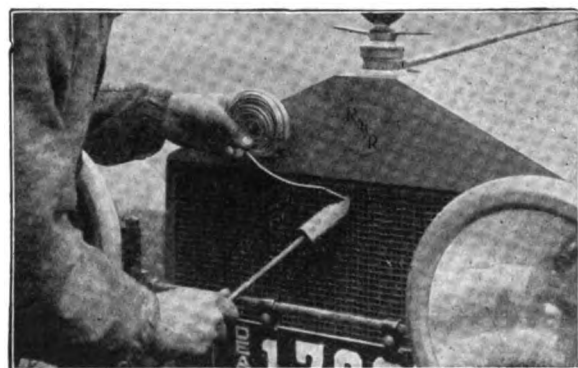
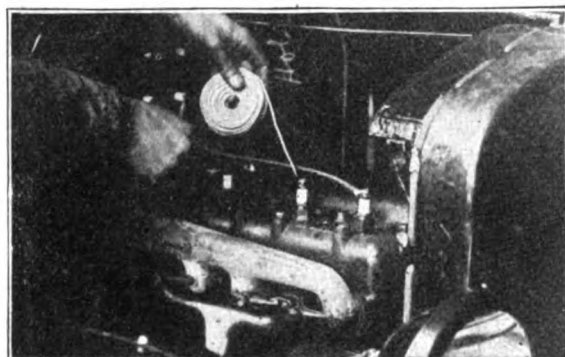
These difficulties are eliminated when you use Kester Acid-Core Wire Solder. No hunting and preparing the soldering flux--no fuming and "cussing" when applying it to some hard-to-get-at part.

The core of the solder tube is the soldering flux which feeds with the solder. There is a saving of time, labor and material.

Kester Acid-Core Wire Solder is invaluable for soldering Radiators, Carburetors, Gasoline Tanks and Joints, Coil Boxes, Battery Terminals, Speedometer Flexible Shafts, Spark Plug Terminals, Electrical Connections and General Garage Use.

Sold in 1-lb. coils and in cartons,
and on 1-, 5-, and 10-lb. spools.

Order from your jobber or direct.
Sample on request.



Chicago Solder Co.
CHICAGO - U.S.A.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Practical Hints for Shop Mechanics

By G. L. Shelley

Shop-Made Bronze Hammer.

A mechanic occasionally finds use for a bronze hammer, and if none happens to be in his regular tool equipment, an excellent one may be made from a section of bronze bushing stock. This tool will be found most useful for work on sheet metal parts of the body and fenders. Thread a steel bar, run on a nut and then place another nut on the outside, and the head of the hammer will be firmly retained.

* * *

Spindle Bushing Remover.

A handy tool can be contrived for the purpose of removing steering spindle bushings. Use a piece of $\frac{3}{8}$ -inch round steel, bending it slightly about 2 inches from the end. Be sure that the tool is long enough to pass through the steering knuckle, leaving an inch or two sticking out on which to hammer.

* * *

Making a Piston Rack.

It should be the aim of every automobile mechanic to keep his work-bench tidy. After removing pistons from a car, if carelessly laid upon the bench, not only an untidy appearance results, but the pistons are subject to accidental injury as well. This can be avoided by constructing a piston rack consisting of a strip of bar stock bent to shape and bolted to the back of the bench in an upright position, and on the horizontal crosspiece, which is about 12 inches high, secure twelve pins about $4\frac{1}{2}$ inches apart on which can be engaged the wristpins of pistons.

* * *

Fixing Short Circuits.

Most of the troubles likely to be found in electrical systems are those arising from short-circuits, grounds and small leaks of current caused from defective insulation, switches, loose terminals, etc. In running down such troubles, be sure to go over all the wiring very carefully to make sure the insulation is intact.

In a two-wire system, to cause a short-circuit, the grounds must appear between both wires and some part of the chassis, while in a one-wire circuit a contact anywhere between the wire and the frame will cause a short-circuit. In both systems, where connections are made, the joints should be carefully soldered and taped.

See that none of the wires can chafe against another wire or part of the car. Examine all binding posts, clamps, etc., used to connect the motor switch, starting motor, generator, horn, dash instruments, switches and battery. Heavy sulphation of the battery is caused from a trifling ground in the battery circuit, and a worn starting

switch is sometimes responsible for stripped flywheel gears.

* * *

Can for Oily Waste.

A garage equipment is incomplete without an oily waste can. It should be placed where all oily, inflammable waste can be put into it, rather than to throw it on the floor—an act of gross carelessness and not permitted by many insurance companies.

* * *

Spring Compressing Tool.

Occasion sometimes arises when it may be necessary to compress a stiff spring on a rod or bolt sufficiently that a nut or pin can be put on to the end of the rod or bolt to hold the spring in place. No doubt every mechanic has attempted to accomplish this with the aid of a pair of pliers, or sim-

Straightening Bent Parts.

Among necessary tools for straightening bent parts the repairman will find especially valuable a large straightening table. It should be about 28 by 30 inches in size and the top made of cast iron, three inches thick, supported by two-inch pipe for the legs, which are held in flanges at the bottom that are securely bolted to the floor. The table should by all means be so strongly constructed as to withstand violent blows.

* * *

Gum and Fabric Container.

A convenient arrangement can be made for holding gum and fabric where several mechanics may be engaged at one table, which will enable them to work without interfering with each other. The arrangement is a wooden frame so constructed as to hold several rolls of fabric, securely fastened to the table by a stand which revolves in any direction and so can be used by workmen at extreme ends of the table.

The frame should be constructed of 2 by 4 boards, through the sides of which bore holes for the support of the rolls. A half-inch pipe will answer for a support on which the rack can revolve, with one end screwed into the collar which is secured to the table. Then bore a hole a trifle larger than the pipe in a 2-inch flat iron, allowing this hole to extend into the wood about an inch, and to this iron screw another collar to hold the pipe. In

order that the table may be kept free from tools of all descriptions, such as knives, rollers, scissors, etc., they can be hung on the end uprights of the rack.

* * *

To Frost Bulbs or Lenses.

The repairman is sometimes called upon to frost electric light bulbs or lenses, which can easily be done by the following method: Mix well 24 ounces of ether and 18 ounces of benzene. To this add $2\frac{1}{4}$ ounces of sandarac and one-half ounce of mastic. The parts to be frosted should be immersed in this solution for a few minutes when the desired result will be attained.

* * *

Guide Bushings.

It may not be generally known by the average repairman, yet it is a fact that in engines that are not fitted with special valvestem guide bushings, excessive wear of the guide, valvestem side play and oil leakage may be prevented by reaming the guide and fitting a bronze bushing. This bushing can be obtained already machined from any supply house. In fitting be sure that the valve centers on the tappet,

ONE DOLLAR EACH

Each shop hint and illustration printed in this department means one dollar to the person sending it in. You have some time or labor saving ideas which you know are thoroughly practical. Tell us about them in your own language. Write out a brief description, with a sketch if necessary, that is all we require. We will fix up the sketch for reproduction, a finished drawing is not needed, simply a free-hand sketch. You get a dollar if the idea is worth publishing.

—American Garage & Auto Dealer, 116 S. Michigan Ave., Chicago, Ill.

ilar tool, and discovered the difficulty of so doing, due to the continual slippage and the strength required.

This can be overcome in a very simple manner with the aid of a strong strip of wood, twelve or fourteen inches in length, through the center of which should be bored a hole of sufficient size to slip over the rod or bolt. Be sure also to cut a slit into the board from the edge to the hole which will enable one to slip the board away from the rod after the spring is pushed down to the desired position and nut or pin applied.

* * *

Uses of Small Vice.

No repair shop is complete without a tiny metal vice, which has a spread of three or four inches—amply large for all ordinary work. Such a vice can be used to better advantage than pliers for the purpose of straightening wires, cotter pins, and such small articles, as well as in compressing springs. These are only a few of the hundreds of uses to which such a vice can be put, as the mechanic will discover with every job he does.

Would you like this money, Mr. Garage Man?

Of course, you want to make more money by increasing your business.

A source of big revenue for garages is rapidly developing in the steadily increasing use of Electrical Starting and Lighting Equipment. This equipment requires installation, repairs, adjustments, renewals, etc.

The demand for this service has grown so that you must now prepare to meet it, or lose your trade to your more enterprising competitor. Practically all first-class garages now are fully equipped to handle this trade.

Here is a complete Electrical Testing Equipment which you can install at small cost and which will furnish you a full and permanent equipment. It will enable you to meet all competition in the electrical line, and more than hold your own.

Weston

Model 280

GARAGE TESTING INSTRUMENT

In reality, this Instrument is the equivalent of six separate Measuring Instruments of different ranges. It provides a means of making any tests that are necessary on electrical starting and lighting systems. It enables you to locate electrical troubles quickly and apply the proper treatment to remedy them.



This Instrument is extremely accurate, durable and serviceable. Its possession will place you a long way ahead of your competitor not so equipped.

We can make prompt deliveries, if you send in your order promptly. Don't delay—write us today.

Weston Electrical Instrument Co.
30 Weston Avenue, Newark, N. J.

| | | | |
|-------------|--------------|---------------|-------------|
| New York | Philadelphia | Denver | Toronto |
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| Cleveland | Richmond | Detroit | Vancouver |
| Cincinnati | Chicago | Seattle | Halifax |
| Boston | St. Louis | Miami, Fla. | Havana |
| New Orleans | Minneapolis | Winnipeg | Mexico City |

else there will be a side thrust against the bushing, thereby causing it to wear eccentrically.

* * *

Loosening Nuts.

No doubt every mechanic has discovered that thus far no car has yet been manufactured that does not have concealed in some inaccessible part of the chassis certain nuts that sometimes require attention, and are impossible to reach with any ordinary tool. This annoyance can easily be averted with the use of a socket wrench of the proper size and a big Stillson wrench to furnish the leverage, which will handle almost any situation.

* * *

Aluminum Cutting.

The cutting of aluminum is a very difficult undertaking owing to the fact that it is a great tool heater, in which way it resembles copper very strongly. The me-

chanic who finds it necessary to cut aluminum can do so by applying a constant stream of cooling or lubricating substance, one of which is a mixture of lard oil and water or kerosene.

* * *

Creepers for Mechanics.

A creeper for mechanics who must work under vehicles can easily be made that is both strong and convenient. Use a 2 by 1/2 inch steel bar for cross pieces, which should be bent a very little and yet give clearance for swivel casters. The slats should be of 4 by 3/4 inch hardwood.

* * *

Buy Good Sponges, Chamois and Waste.

A timely suggestion to the repairman or garage owner who is starting in business is to use every care in selecting sponges, chamois and waste, as inferior grades have many ways of doing considerable damage. Waste usually comes in

bales of 50 or 100 pounds, which is the most economical way to buy it, and nothing but the very best white waste is suitable for automobile work.

Chamois skins are used for cleaning, and should be the most durable and pliable that can be found. A package of chamois usually contains about a dozen skins. The cheaper grade of sponges often contain sand and grit, and will cause scratches and markings on a car that can never be removed, so for this reason, if no other, the best sponge is none too good for the reliable garage man to use.

* * *

Patch Compress.

A very valuable compress in case of an emergency on the road or rush of business in the repair shop, can be made of two blocks of hard wood about six inches square and held together with two small nuts, making a secure clamp for a dough patch in an inner tube.

Chicago Office for Utility Compressor and Trex Rim Tool.

Lieutenant Arthur H. Johnson, late of Uncle Sam's Motor Transport Corps, has opened an office in Chicago for the distribution of the products of the Utilities Sales Corporation and the Trexler Rim Compressor Co., both of Philadelphia. He has acquired a showroom and office at 2111 S. Michigan avenue to serve the territory west to the Pacific Coast and south to Texas.

The Utility Sales Corporation markets the "Low Cost of Cool Air" line of air



Opening Position for Trex Rim Compressor.

compressors produced by the General Utility Co. and President Robert L. Erlichman of the Sales concern helped Lt. Johnson get located in Chicago. One of the three models of air compressors—the Utility—is notable in that it carries tanks of two grades of lubricating oil on its platform between the wheels and the air pump.

The Trexler firm produces the Trex rim compressor, a device for removing and replacing automobile tires used on de-

mountable rims of the split type. It is self-adjustable to any size rim and works like a jack. After letting the air out of a tire and unlocking the rim, the hook at the front end of the compressor is placed over the rim, four or five inches from the split, as shown in the picture. The rear hook is put across on the rim and the handle worked back and forth until the rim is collapsed to the desired distance. The device has been adopted by many tire and repair service stations.

Edward M. Finnerty, formerly with the Zinke Co., will act as district sales manager for both lines and spend most of his time on the road, visiting jobbers and dealers. Robert Lewis will have charge of the office details in the Chicago headquarters. Lt. Johnson was a convoy officer in the Motor Transport Corps and later acted as a purchasing agent to buy automobile supplies for the Motor Transport Corps.

Aksala Carbon Remover Comes in Attractive Can.

Although the Aksala Chemical Company has been marketing the Aksala carbon remover since January 1 on a money back guarantee, not a single can has been returned to the concern. The company declares that the mixture is easy to apply, does no harm to the engine and saves the expense and delay of having the carbon removed by pulling down the motor. It is said that it does not interfere with the lubricant because it is free from injurious compounds, and has no effect on oil.

It is a very efficient cleaner for spark plugs, according to the maker, and it is said that the carbon can be wiped off with a brush or cloth after the carbonized plug is immersed in Aksala. Full particulars for its use are printed on each of the at-

tractive cans in which the liquid is marketed. The concern also produces an extensive line which includes automobile polish, top dressing, stains and tube patches. The president of the company is Daniel J. Killen, formerly a state senator of Nebraska.



Aksala Carbon Remover Can

Full particulars and trade prices can be obtained by writing to the Aksala Chemical Co., 7440 So. Chicago Ave., Chicago, and mentioning the American Garage & Auto Dealer.

PASCO

Greater Mileage

from both gas and tires, are yielded by wire wheels. Motor Engineers and Makers acknowledge this to be a fact.

PASCO Wire Wheels, in addition, will give you more riding comfort, greater safety, will reduce chassis repairs, and will greatly improve your car's looks.

When you have seen the PASCO ingenious safety-lock, the tangent method of spoke-lacing, the indestructible hub-cap, the complete curb-clearance—and when you know that every bit of metal in the PASCO Wire Wheel is rust-proofed—you will begin to see why PASCO'S popularity is growing so rapidly.

The wire-wheel is not a mere fad. It is just plain common horse-sense.

DEALERS: Write us

NATIONAL WIRE WHEEL WORKS, Inc.

GENERAL SALES OFFICES, DEPT G
416-417 Book Bldg., DETROIT, MICH.

FACTORIES AT

Plant No. 1 Geneva, N. Y.
Plant No. 2, Hagerstown, Md.

Branches in

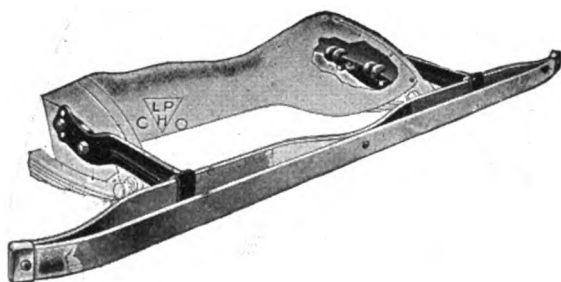
New York Chicago Detroit
Minneapolis Kansas City
San Francisco Seattle
Dallas Atlanta
IN CANADA: Northern Electric
Co., Ltd., Montreal

Accessories — They Bring in Money

Here Are Presented Practical Ideas, Suggestions and Merchandising Plans,
All Relating to Automotive Equipment Which Energetic Dealers Can Adapt
to the Profitable Conduct of the Accessory Branches of Their Business

New Truss Bumper and Fitting Made by Halladay.

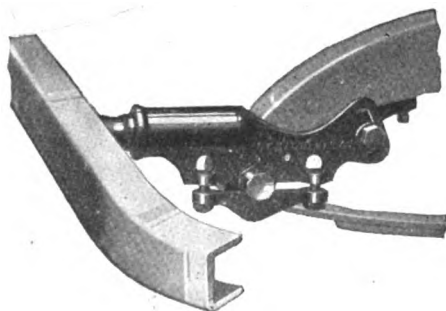
The L. P. Halladay Co., Streator, Ill., has recently produced a new bumper bar, named from its construction the "truss spring." This bar is made in two pieces each, full length of the bar joined at the ends by a flexible connection. The inside or rear bar is curved forward at the center and is secured to the front member, forming a truss that greatly stiffens the bar yet allows it to yield under impact.



Halladay Truss Spring Bumper.

The lines are graceful and the strength enormous, making a bar that is both attractive and affords the utmost protection to the car without the disastrous smashing effect to the object struck that accompany the rigid type of bar. This bar is supplied with the Halladay improved under frame clamp fittings or with any of the Halladay frame connections.

Another new Halladay bumper fitting is especially designed for use on cars equipped with snubbers. For this purpose the frame connection is short, extending back only a few inches from the frame end.

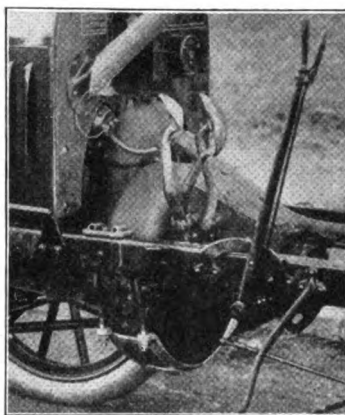


New Fitting for Bumpers.

It has a wide range of adjustment to conform with any angle and curvature of the frame extension. It is supplied equipped with any of the Halladay bars, including the truss spring bar above described.

Liberty Motor Support for Ford Engines.

When Ford motors are used for power plants in trucks and delivery wagons, the use of the Liberty motor support will prevent hanger arms breaking, according to the Motor Support Co., which makes the device. It is also claimed that the device will prevent oil leaks from developing



Liberty Support

where the arms are connected on the sides of the lower crankcase.

The Liberty motor support stops vibration by reinforcing the regular Ford arms with "U" shape hangers by following the lines of the Ford arms, locking over them on top of frame and connecting to the saddle on each side of the crankcase. The Liberty support is declared to be the best device to repair a broken crankcase arm. It can be installed in 20 minutes.

Trade prices and full particulars can be obtained from the Motor Support Co., 431-B South Dearborn street, Chicago, by mentioning the American Garage & Auto Dealer, when writing.

Buettner Products Are Finding Ready Sale.

The makers declare that retail automotive tradesmen are having good success in the sale of the Buettner automobile products. One of these is the Buettner auto cup, which is a simple device that feeds dry graphite uniformly into gasoline engine cylinders by sending it through the intake manifold with the fuel mixture.

It is said to be automatic in action and is claimed that once adjusted to the needs of an engine no further attention is necessary except to fill the cup with graphite when empty.

Other products marketed by the concern include "B" brand sparkplugs, Unisco detachable and endless fan belts for Fords,

Unisco fabric belting, "B" brand belt hooks, and Buettner graphite. Trade prices can be obtained by writing to the Chas. H. Buettner Company, Cincinnati, Ohio, mentioning the American Garage & Auto Dealer.

Spee-Dee Counter Display Card Tells Selling Story Instantly.

Many pieces of dealer display matter are planned and furnished to the dealer solely to advertise the manufacturer's product. A counter card prepared to really help the dealer sell the product—by acting somewhat as a personal salesman for the manufacturer—is the nature of a very original piece now being supplied to all dealers selling Spee-Dee.

Spee-Dee is a unique preparation, gritless and harmless, intended for the thorough cleansing of hands and all kinds of material. Its variety of uses makes it salable to all classes of people from maid to mansion mistress—from mechanics to the banker that drives his own car.

It comes prepared for quick service and is used just the same as soap with the big exception of not requiring water. All of this, together with illustrated suggestions of its many uses are graphically presented by the Spee-Dee counter display card.



Spee-Dee Counter Display Card

The card itself is lithographed in several colors.

By a special folding arrangement space is provided for the display of an actual can of Spee-Dee. The counter card is now being sent free and it will be sent to automotive tradesmen on application to the States Chemical Company, 680 West Austin avenue, Chicago, Illinois.

ROMORT PRODUCTS

Here's the Way to Real Profits with the EWALD

Tire Retreader Outfit

TAKE ADVANTAGE OF THIS BIG FREE OFFER TO REPAIR SHOPS AND GARAGES.

We Give You Free of Charge

with each machine, an assortment of 1000 Ewald Special Staples.

Our extremely low list price of \$20 is subject to an attractive trade discount, which together with the **free outfit** will repair more than enough tires to pay for it all.

Just think—5 hours of work, Stapling 5 casings at \$3.00 each and this outfit costs you nothing.

Get It Now and Begin to Make Real Money.

Write us today and start the ball rolling toward big profits. Some repairmen and garagemen are making as much as \$30 a day with the Ewald. Act Now—Every day you Delay means money out of your pocket.



HERE IS MORE THAT YOU GET ABSOLUTELY FREE !!

- 1 Full Sheet of Directions.
- 1 Can of Mica Tire Powder.
- 1 Tracing Wheel.
- 1 Notched Knife.
- 1 Tire Spreader.
- 1 Cement Brush.
- 18 ft. Reliner Strip.
- 1 Can Cement.

Factory Sales Representatives
THE ZINKE COMPANY
 1323 S. MICHIGAN AVE., CHICAGO, U.S.A.
 Manufacturers
ROMORT MFG COMPANY
 OAKFIELD, WIS., CHICAGO, ILL.

Solutions for Mechanical Problems

By E. B. Hinrichsen

To Prevent Springs Squeaking and Leaves from Breaking.

Question:—I have been bothered a good deal with springs squeaking and leaves breaking. I have bought spring spreaders and oilers of one kind and another and they are all good as long as they last. The trouble is that they lose their effect too soon. I jack up the car and spread the leaves. Then I either work in grease and graphite or squirt oil in. This does the work for a while, but it does not last long enough and is a lot of trouble.

I drive rather fast over rough roads and in all kinds of weather. I don't care much about the looks of the car and have an idea of soaking some felt or something of the kind with oil and wrapping it around the springs. Do you think that will do the work and will it last longer? Also will it have any bad effect on the springs?—J. J., Minn.

Answer:—If you do not care about looks you can wrap the springs with felt. I believe you could improve on your original idea by making two oil cups for each spring. These oil cups should be mounted on plates that can be clamped to the springs. They should be located one near each end of a spring—close to the shackles. They should be drilled so that when oil is put in it will run down and soak into the felt.

After the felt and oiling devices are on the whole should be wrapped tightly with tape and the tape shellaced. This will keep the spring leaves permanently oiled and will have no bad results outside of the appearance. There are some devices on the market that are intended to accomplish the same thing and you might look some of them up in a good supply catalog. It might save you some work.

* * *

Solid or Pneumatic Tires for Trucks.

Question:—We have a two ton truck of a standard make equipped with solid tires. This truck is now about two years old and needs new tires. The driver wants us to put on pneumatics. He says that the truck will last longer and that we will not have so many repairs. The breakage of parts such as springs, axles and engine hangers has been large during the last six months and was bad enough before that.

The driver says this breakage has been increasing as the tires wore down. Have you any figures on how much difference there would be in price between solids and pneumatics and how much longer the solids will wear? Also do you think the driver is right about re-

ducing our repair bill?—C. J. & Co., Illinois.

Answer:—There is no doubt that the use of pneumatic tires would reduce breakage unless your travel is over uniformly smooth streets. The first cost would probably be greater than that of solid tires, especially as you should carry an inflated spare tire. Any tire dealer can quote you prices on both kinds and your local truck agent can give you the cost of making the change.

I think you will get as good, if not better, mileage from the pneumatics, especially if you provide the driver with a small vulcanizer and he keeps all casing cuts closed.

There is a tendency among truck owners to keep on using the solid tires after they have become so worn that there is not enough rubber left to take up the road shocks. From the length of time you have used yours I am of the opinion that this condition accounts for your large repair bill during the last six months.

I have no figures available as to mileage and a good deal depends upon local conditions. Perhaps some one in your locality is using pneumatics and can give you an idea.

* * *

Locating a Knock.

Question:—Some time ago a car was brought in for repairs. The owner claimed there was a knock. We tested it out and a new set of wrist pins was fitted and the bearings taken up. The engine is now perfectly quiet except for a slight click that can hardly be heard. We have spent days trying to remove this.

Every bearing has been gone over. Every tooth in the gears has been carefully examined. All of the valve lifts and the pump plunger have been ground true. All the cams, including the pump eccentric, have been examined for inequalities. The valves, tappets, springs, fan, clutch and clutch thrust bearing and in fact every moving part even to the fan belt have been gone over and nothing found.

The owner is something of a crank and while he does not object to the click he is afraid it is something that may break later. We have tried to convince him that there is nothing that will cause trouble but can't do it. Can you suggest what might be causing this slight noise and how to remedy it? We are willing to try anything.—J. F. B. Co., Indiana.

Answer:—As you do not give the make of the car, I cannot be sure but think you have a plunger type pump as you mention the pump plunger and ec-

centric. I once found a very similar case of trouble in one of the pump check valves. This check was the ball type and for some reason or other the ball made a constant clicking. The check was replaced and no more trouble ever developed. If your inspections of the other parts of the engine have been thorough, this is the only suggestion I can make, as there is nothing else left.

* * *

Oiling a Charging Motor.

Question:—I have a 1917 Overland and have been having trouble with oiling the chain and front gears. We opened the case this spring and found that the chain that drives the charging motor had been running dry. There are two pipes from the pump. One runs up to the glass on the dash and the other to the front gears.

The instruction book calls the one to the front gears the overflow pipe and tells how to adjust the pump to pump more or less oil.

What I want to know is how to tell when the pump is pumping enough oil so that some of it goes to the front gears. I have set it so a lot comes through the glass but don't know whether any is going to the front or not.—S. S., Michigan.

Answer:—The best way would be to disconnect the pipe at the front or timing gear case and run the engine. You can then adjust the pump until oil comes out of this pipe. Better give it too much oil than not enough.

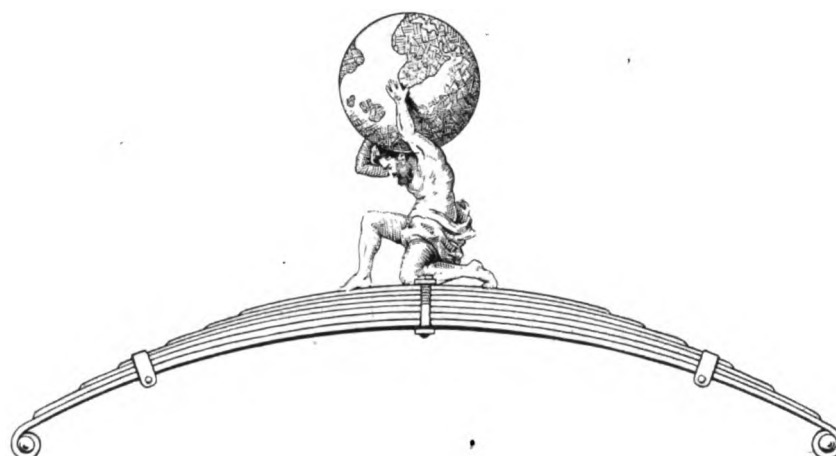
* * *

Oil Cups for Springs.

Question:—I have heard a lot lately about using oil cups instead of grease cups on springs, tie rods and other places. Is this better and why?—A. F. G., Illinois.

Answer:—The oil cups are much more convenient as they only require refilling and need not be screwed down. Oil penetrates more quickly than grease and is a better lubricant. Equipped with a wick the oil cup does not need to be filled any oftener than the grease cup, and the filling of it is much cleaner and quicker. I think on the whole the oil cups are a great improvement.

Are you keeping in touch with the legislation which affects your own line of endeavor so that you can help along good work wherever it is proposed and use your influence to check that likely to be harmful to the best interests of your line?



THE spring bears the responsibility of the entire automobile world.

On it depends the comfort, the very lives, in fact, of those who ride in motor cars.

On it depends, too, the life and upkeep of the automobile. For engine, mechanical parts, and tires are all vitally affected by spring action.

How important then, that Harvey Springs be used *always*.

This is a case where good judgment says use the best.



BOLTLESS
AUTOMOBILE
SPRINGS

Easy Riding - Guaranteed

Write for free Harvey Book of Springs containing specifications for all springs.

Harvey Spring & Forging Co.
1046 - 17th Street, Racine, Wisconsin

Trailer Makers Have Big Program

Executive Committee of New National Association Adopts Plans for Work of Constructive Character—Will Draft Trailer Regulations as Recommendations for Enactment—Improvement of Country's Highways Is Advocated

By H. W. Perry

General Manager, Trailer Manufacturers' Association.

An extensive program of work for the Trailer Manufacturers' Association of America was outlined at an all-day meeting of the executive committee held May 15 in the offices established at 110 West 40th street, New York City.

Legislation and promotion of a better public knowledge of the trailer and its applications were given most consideration, as being of greatest importance at the present time. It was decided to call for suggestions from all members for provisions relating to the regulation of trailers and to incorporate these in a set of recommendations. These will be sent to the Highway Industries Association with a request that they be embodied in the uniform traffic bill which was drafted by a joint committee representing the Highways Transport Committee of the Council of National Defense, the Association of State Highway Officials, the National Automobile Chamber of Commerce, the Highway Industries Association and the American Automobile Association.

Contact is to be established with state and local motor truck and team owners' associations, automobile clubs, good roads associations and commercial organizations, and to furnish information and suggestions to them for action to be taken with respect to the various measures. It will be urged that bills believed to be detrimental to the best interests of commerce and industry in general should be opposed and those that are just, reasonable and desirable should be advocated. The trailer manufacturers will not oppose all legislation but will plan to initiate and endorse fair measures where no trailer regulations exist.

As an instance of this purpose, the executive committee passed the following resolution:

Favor Townsend Bill.

"Resolved, That the Trailer Manufacturers' Association of America favors the creation of a Federal Highway Commission and the construction and control of a system of national highways by the United States Government through such a commission, as provided in the Townsend bill introduced during the last session of the Sixty-fifth Congress, and urges the early passage of such a measure by the Sixty-sixth Congress with a view to providing better military defense, facilitating interstate transportation of persons and goods, reducing the cost of haulage by highway, increasing the production of foodstuffs, raising the standard of educa-

tion and living in rural sections, and uniting the thought and sentiment of the people of the country through more frequent and easy intercourse."

In the matter of general promotion work, it was decided to make a report to members and some other trailer manufacturers covering an investigation that has been made into the merits and advantages of national publicity and to begin efforts immediately to increase the membership of the association with a view to providing a sufficient fund for the purpose.

The Southern Motor Manufacturing Association, of Houston, Texas, is the latest addition to the membership list, making fifteen members to date.

A Trailer Standards Committee was appointed to confer with the Trailer Sub-Division of the Truck Standards Division of the Society of Automotive Engineers in all matters pertaining to standardization of trailers, trailer hitches, etc. Those appointed on the committee are W. R. Hudson, engineer of the Troy Wagon Works Co., chairman; H. G. Farr, engineer of the Martin Rocking Fifth Wheel Co., and the writer.

Thanks N. A. C. C.

In a resolution passed at the meeting, a vote of thanks was extended to the National Automobile Chamber of Commerce and to R. A. Brannigan, of the N. A. C. C., for their efforts in pointing out to the Commissioner of Internal Revenue that trailers and semi-trailers are not taxable under the revenue tax act of 1918. The Treasury Department, in Regulations 47, just issued, rules that two-wheeled and four-wheeled trailers are exempt.

The committee considered the question of advisability of including motor truck routes as common carriers to be regulated as to routes, rates and stock issues by the Interstate Commerce Commission, as proposed tentatively by Congressman Esch. No decision with regard to recommendations in the matter was reached, but it was the general feeling that while a certain amount of regulation might be beneficial, insufficient experience in the operation of motor truck transportation lines would make it difficult and inadvisable to establish a fixed scale of shipping rates and that federal control over the organization and financing of such lines might retard development.

Use of a standardized cost account system for motor trucking was approved, and while not endorsing any specific system, it was the sentiment of the commit-

tee that trailer manufacturers should urge truck and trailer operators to install a uniform system so that results can be compared. The general principle of controlling trailer brakes by air pressure was also endorsed.

In July a general meeting of members of the Trailer Manufacturers' Association will be held. The date and place have not yet been set, but Rochester may be selected.

Members of the executive committee in attendance at the meeting were: W. E. Ferris (Ohio), president; R. C. Sykes (Troy), second vice-president; W. R. Bonds (Detroit), C. H. Martin (Martin), H. M. Wood (Trailmobile), representing J. C. Endebrock, secretary-treasurer, and the writer. Several territorial representatives of member companies were also present, including A. R. Miller, of Philadelphia.

Makers Set Dates for Chicago and New York Shows.

At the annual meeting of the National Automobile Chamber of Commerce, held at New York City June 4, the manufacturers decided to hold their national shows in New York, January 3 to 10, and Chicago, January 24 to 31, for both passenger cars and trucks.

There was a broad discussion of general conditions affecting the industry, including the progressive work of the government in highway matters, the increasing amount of unfair legislation and taxation against the six million owners of automobiles. Motor fuel and patent matters also received attention.

The N. A. C. C. lawyers endeavored to interpret the new rulings of the Treasury Department relative to taxes on motor cars and motor trucks.

A resolution was passed asking Congress to repeal all manufacturers' sales taxes, including those on cars and trucks as suggested by President Wilson in his recent message.

The following directors were re-elected: John N. Willys (Overland); H. H. Rice (Chevrolet); Roy D. Chapin (Hudson); C. C. Hanch (Studebaker); and J. Walter Drake (Hupmobile). At the next meeting a constitutional amendment will be offered increasing the directorate from fifteen to eighteen members to provide further for representatives of the fast growing truck industry. At present there are five directors from truck manufacturers on the board.

NATION WIDE SERVICE

The jobber is your friend; he is interested in the selection, the installation and the maintenance of your equipment. Your success is his success. Naturally, then, the jobber through salesman and correspondence, is always at your service. You may be distant from the factory but there is a Brunner jobber near you.

Your air system is valuable in proportion to the work it does without trouble. Therefore, it is important that you purchase from a company truly interested in your success, ready to help you in selecting the right outfit and prepared to offer prompt maintenance service.

Brunner equipment, all sizes and styles, is handled by 70% of the important jobbers. Wherever you are located, the Factory offers, through one or more of these representatives, whatever service you may need. Factory men are available in emergency.

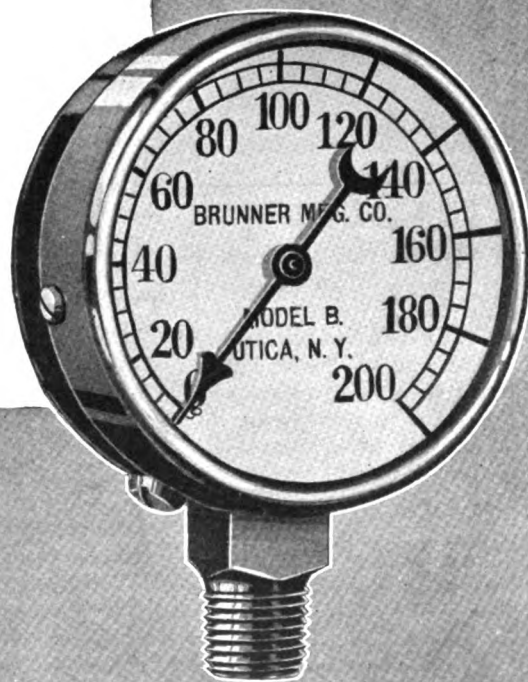
Tell us how we can serve you best.
Write for illustrated folder.

BRUNNER MFG. CO.

MAIN OFFICE AND PLANT

UTICA, N. Y.

Branch Cincinnati, Ohio

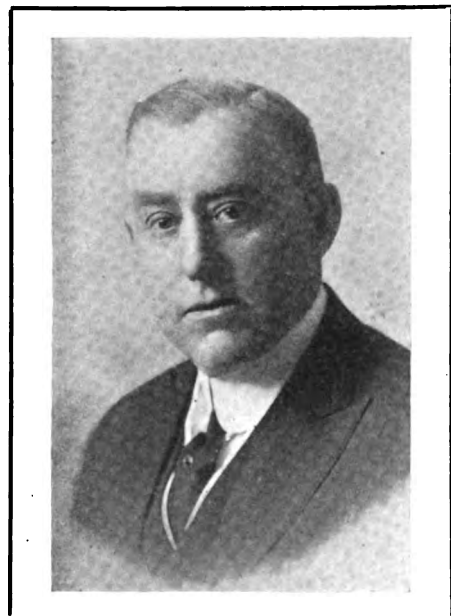


News of Manufacturers and Jobbers

Corlew Manages Vulcan Spring Branch in New England.

Frank S. Corlew is now manager of the New England branch of the Jenkins Vulcan Spring Co. of Richmond, Ind. An appreciation of the established reputation of this company, combined with resources of a most staple character, was responsible for his decision to direct the activities of the Jenkins Company in New England. The New England branch is located at 819 Boylston street, Boston, Mass.

Mr. Corlew's mercantile career began when about 15 years ago he became sales manager of the New England branch of the Fowler Bicycle Co. of Chicago. When the motor car became a commercial success Mr. Corlew became sales manager of the Adams Sutton Company, pioneer distributor for the Oldsmobile in New England. In 1909 he was prominently identified with the introduction of the Velie in New England territory.



Jenkins Vulcan Spring Co. Makes Frank S. Corlew New England Head

Eight years later Mr. Corlew accepted the position of manager of the Washington office of the Motor Products Corporation of Detroit. While in this capacity he was in full charge of this concern's operations during their co-operation with the United States Government during the war. He is a member of the Bay State Automobile Association and other motor organizations.

Advance Cork Insert Gains Big Distribution in Two Years.

"It is very satisfactory," said M. O. Smith, sales manager of Advance Automobile Accessories Corp., 56 E. Randolph Street, Chicago, "when I read our missionary men's reports and find on one after

the other—'Cork Insert and White Stripe in stock—well satisfied.'

"Look at these reports—from all over the United States and most all of them from small towns. That shows we have a good distribution, and if our goods were not right, dealers would not stock them.



M. O. Smith, Sales Chief of Advance Accessory Firm.

"Of course all the jobbers carry stock. They are supposed to, but it's the dealer's stock that tells the story of successful goods and distribution. Advance has territorial salesmen calling on jobbers and each salesman has two missionary men constantly combing the territory for new avenues of business.

"The selling plan has been met with by all jobbers and dealers in a most gratifying manner and today after two years in the field Advance shows a sales distribution that is quite remarkable."

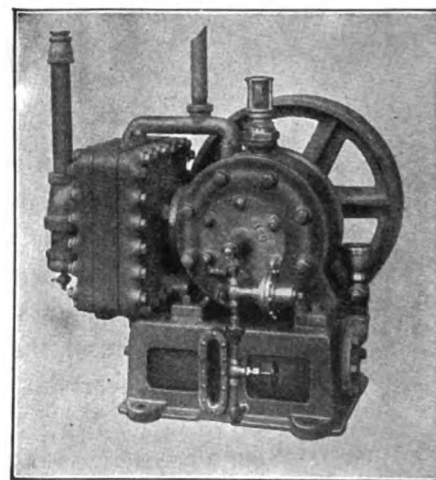
Production of Jackson Air Compressors Is Resumed.

Having completed its war work contract, the Jackson Compressor Company has again turned its Denver plant to the production of air compressors. For the present the concern will concentrate on three different sized machines, one for mines and general purposes, one for automobile plants, and a smaller machine that will do for small filling stations, garages, and repair shops.

The smallest machine, which is styled 2 A 2, was found during a recent test to compress up to 100 pounds in five minutes, 35 seconds; to 120 pounds in six minutes, 30 seconds, and to 140 pounds in eight

minutes, 30 seconds. The cubic contents of tank and fittings are 5,750 cubic inches.

The cubic contents of a 9"x42" tire are 4,447.37 cubic inches and the time which the 2 A 2 machine required to inflate a



Jackson Air Compressor

tire of this size up to 120 pounds was five minutes, 25 seconds. The cubic contents of a 12"x48" tire are 8,696 cubic inches and this machine inflated a tire of that size up to 140 pounds in 14 minutes. Trade prices and full details can be obtained by writing to the Jackson Compressor Company, Denver, Colo., mentioning the American Garage & Auto Dealer.

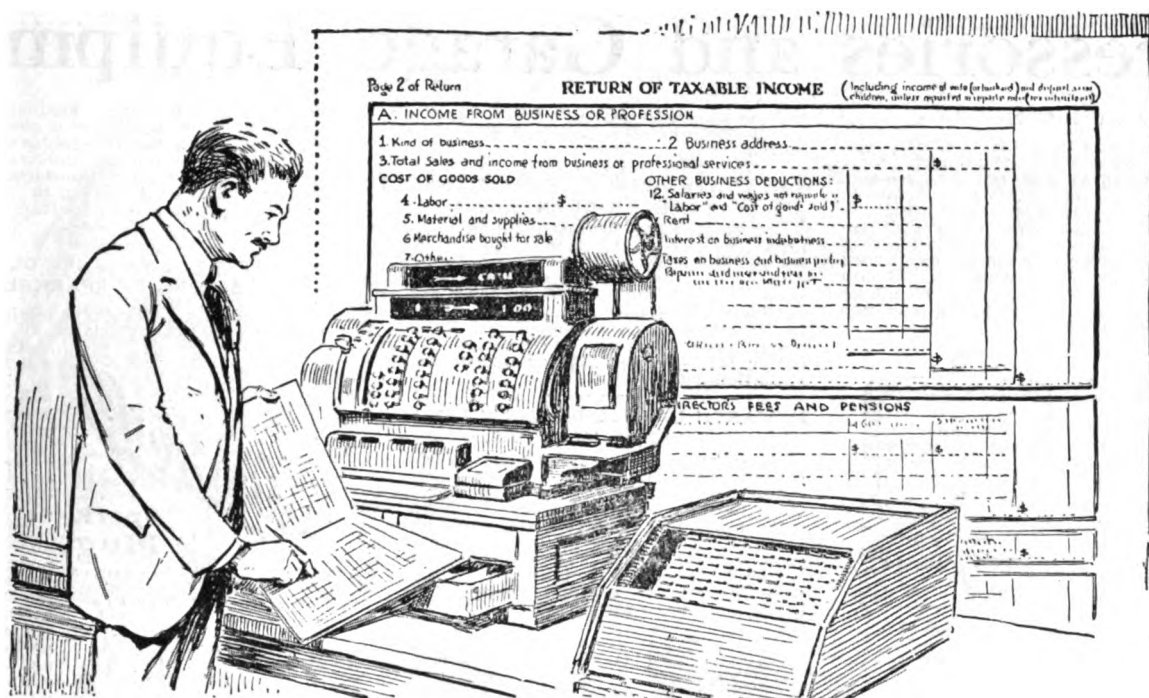
Trade Experts Endorse Shaw Signal Device.

Automotive experts of Grand Rapids, Mich., where the Shaw automotive signal is produced, declare that the device is one of the best of the kind they have ever seen. Stanley A. Smith, production engineer of the Simplicity Wheel Co., says that he has been familiar with the various signalling devices on the market and up to the present time he has not seen anything anywhere near as good as the Shaw signal.



Shaw Signal Device.

The New Era Spring & Specialty Co. has also endorsed the signal, stating that it is the most practical device ever seen by the New Era officials. A. A. Carroll, superintendent of Police at Grand Rapids, believes the general installation of the Shaw signal would prevent many accidents. The device is made by the Shaw Signal Co., 1706 Division Avenue, Grand Rapids, Mich., and trade prices and full details can be obtained by tradesmen who mention the American Garage & Auto Dealer.



Every garage man and accessory dealer needs accurate records for two purposes

- ① At the end of each year he needs a complete report of office and service transactions to help make out his Income Tax return.
- ② He needs these same figures every business day. He needs them to control his business.

He needs these figures to know how much money he is making, and what it costs him to do business.

Every garage owner and accessory dealer can get a record of his daily transactions in two ways—the old-fashioned way, by hand, or he can get them by machinery.

A modern National Cash Register makes accurate, unchangeable records. It clas-

sifies, adds, certifies. It saves work and reduces expenses.

No man in the garage or accessory business should keep records by hand that can be kept so easily by a National Cash Register.

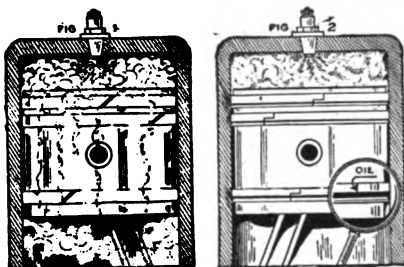
A post card will bring full information about what an up-to-date National will do to help you.

The National Cash Register Company
Dayton, Ohio
Offices in all the principal cities of the world

Accessories and Garage Equipment

NO-LEAK-O PISTON RINGS.

When a new motor comes from the factory it runs splendidly for a few hundred miles. Then it begins to leak both oil and gasoline. The cause of this leakage, is the shrinkage or warpage of the cylinder walls which is sure to take place in all new motors. When this shrinkage takes place, the piston ring cannot conform to the depressions or warped places: the pressure from explosion, vacuum and other forces breaks the seal of oil as the ring passes over these spots, the gas escapes and the oil passes up.



How Piston Rings Waste or Save Fuel.

There was put upon the market about four years ago a new design of piston rings claimed to prevent this leakage which has become very popular. The ring is made in one piece under patented processes, by which even tension is secured on the cylinder walls. Lubrication is perfected without the waste of oil, hence little or no carbon. A groove is cut around the face of the ring at a right angle to its face, sloping at an angle of about 45 degrees. It is claimed this groove fills with oil and when passing over the warped spots, or depressions, the volume of oil in the groove is sufficient to prevent the seal being broken. Thus the motor continues to give maximum power during the life of the ring.

It is claimed these rings restore the power of any used car where the cylinders are not scored. The ring is manufactured by the No-Leak-O Piston Ring Co., Baltimore, Md., which guarantees every set put in to give satisfactory service or money refunded.

OWENS PLANT DOES WELDING FOR AUTOMOTIVE TRADESMEN.

Frank Chas. Owens is conducting a thoroughly equipped plant in Chicago for doing welding, cutting and brazing jobs for garage men and owners of automotive repair shops. Mr. Owens has fitted up his establishment to cater to retail automotive tradesmen who receive repair jobs requiring welding, brazing or acetylene cutting that need the use of facilities beyond those of their own plants.

Mr. Owens has established his shop at 19 North Morgan street, Chicago, and it contains the most modern equipment for the most rapid and thorough work in welding, cutting and brazing. Mr. Owens has had many years of experience in this line and is

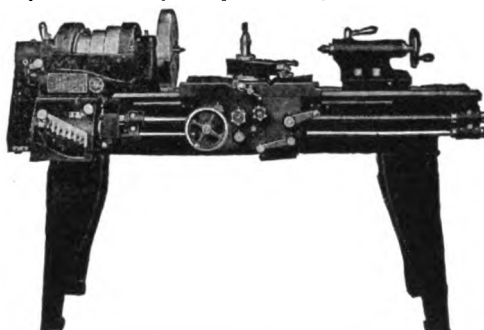
now doing work for many garagemen and repair shop owners in the Middle Western States.

SIMPLICITY WHEEL FIRM MOVES TO LARGER QUARTERS.

Owing to the growing demands of business, the Simplicity Wheel Co., of Grand Rapids, Mich., has found it necessary to increase its production capacity in order to take care of the requests for Simplicity products. The new plant, which is located at 710-712 Monroe avenue, Grand Rapids, is much larger than the old one and permits better facilities for greater output and installation work.

MONARCH LATHES DO MANY KINDS OF WORK IN SHOPS.

Many automotive tradesmen have purchased Monarch lathes in the last few months so that they have been able to do work in their own shops that formerly had to be sent out. Monarch lathes are used in every class of work from the finest tool room service to the production work of the larger factories. This machine is said to be very accurate, of rigid construction, and quick and easy to operate.



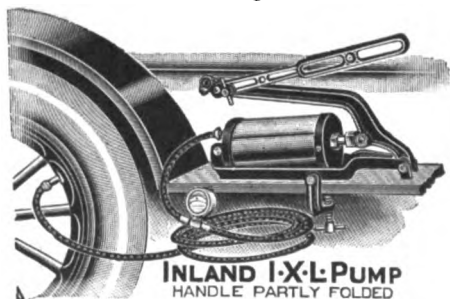
14" x 6" Monarch Lathe

Monarch lathes are made in four different sizes, 14" x 6", as well as 16, 18 and 20 inches. They are furnished with taper attachment, milling, keyway cutting, gear cutting, and other useful attachments for use in automotive repair shops.

Full particulars and trade prices will be sent to tradesmen who write to the Monarch Machine Tool Co., 101 Oak street, Sidney, Ohio, mentioning the American Garage & Auto Dealer.

INLAND LEVER PUMP HAS MANY ADVANTAGES.

The Inland I. X. L. lever pump stands out prominently among running board pumps on account of its exclusive features and unusual power. The cylinder is a drawn steel shell absolutely air tight on the air end, as the valve is the only outlet. The plunger is made of the best grade of leather, specially oil treated to assure long service.



Runningboard Tire Pump

Security against the pump coming loose from the running board is provided for by a powerful clamp which is firmly riveted to the frame. The handle is of a patented folding type. When the handle is folded the pump occupies a space 13 1/2 inches long by 4 inches wide by 5 inches deep.

The power developed is claimed to be 18 times that of the ordinary foot pump which makes it adaptable for trucks as well as passenger cars. It is possible to develop 250 pounds pressure. It operates easily and it is claimed that a woman or child can readily inflate a tire to 90 pounds pressure. It is

finished in dark green enamel with nickel plated cylinder and makes a neat appearance on the running board. Jobbers and dealers may obtain particulars and trade prices by writing the Universal Manufacturing & Sales Company, 550 W. Harrison St., Chicago, and mentioning the American Garage and Auto Dealer.

AIR INTAKE IS FEATURE CLAIMED FOR SHURNUFF SPARKPLUG.

One of the advantages claimed for the Shurnuff sparkplug is that it has an auxiliary air intake which introduces



Shurnuff Sparkplug.

air into the cylinder with each downward stroke of the piston. A ball valve prevents any escape of compression on the upward stroke. The air enters the plug above the firing points and breaks up the gas pocket that tends to form at this particular place. The gas pocket is formed as a result of a certain amount of mixture not exploding, and the free oil in the mixture accumulates on the porcelain.

The additional air introduced at each stroke of the piston increases the amount of oxygen in the cylinder and produces a more perfect mixture which explodes more completely and with less carbon deposit on porcelain, cylinder head, piston and valves. This increased oxygen is especially needed now on account of the present low grade of gasoline. It is manufactured by the Shurnuff Mfg. Co., 3147 Locust St., St. Louis, Mo., and trade prices and full details will be sent to tradesmen upon request by mentioning the American Garage and Auto Dealer.

COX BRASS COMPANY BRINGS OUT RESERVE FUEL TANK.

"When Your Gasoline Gives Out" is the title of a little booklet gotten out by the Cox Brass Mfg. Co., to describe its reserve gasoline tank for Ford cars. The tank is made entirely of a drawn brass shell without seams, and is attached to a special cap which takes the place of the cap already in a Ford tank. The reserve tank has a capacity for about one quart of gasoline, or enough fuel to run a Ford car four or five miles.



Extra Fuel Tank.

The maker believes that the tank will find a ready sale by automotive tradesmen and accessory dealers, especially as it requires no extra room. No matter how careful drivers are, there are times when they are forced to stop on lonely roads because their fuel has been exhausted and it is to do away with the necessity of these stops that the Cox reserve tank has been designed. The tank is fitted with a gauge on the side that tells the contents of the fuel tank at a glance.

Full details and trade prices can be obtained by writing to the Cox Brass Mfg. Co., Albany, N. Y., mentioning the American Garage and Auto Dealer.

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....

.....

.....

Name

Address



GLOBE AIR COMPRESSORS

As the big liners performed invaluable service in getting the boys to France (and back) so Globe Compressors are proving their value in thousands of garages.

The speed with which the transports carried 2,000,000 men across, surprised the world. Globe Air Service will surprise and gratify your customers.

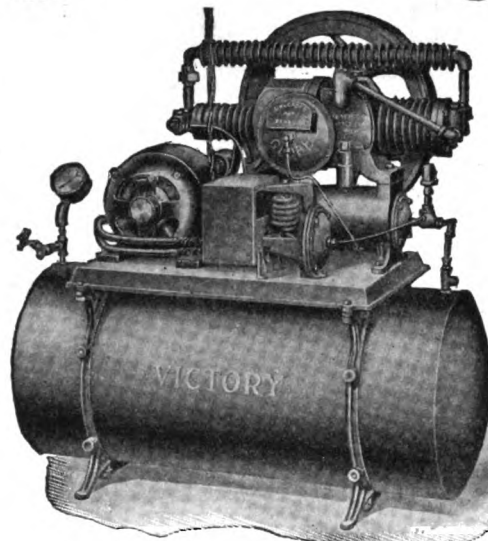
Since we put the "VICTORY" on the market, we have received numbers of unsolicited testimonials from users, attesting to the superior service afforded by these compressors.

They have made good because they were designed and standardized according to actual operating conditions.

Made of the finest materials, with the most expert workmanship, they operate consistently for long periods, with little or no attention. Rapid, reliable free air service is essential to the first class garage. Globe Air Equipment will enable you to give a service that will bring you good will and big returns.

Write today for particulars

Globe Mfg. Company
BATTLE CREEK — MICH.



**The "Victory" Complete Motor Drive
Compressor Unit**

substantially mounted on steel air storage tank, making the most compact, attractive and serviceable Automatic Air Equipment. Unequaled for free air stations.



The "Victory Portable"

Same as the Victory, but is provided with truck attachment. When not being moved, is virtually a stationary equipment resting securely on four feet.

MYERS SPARKPLUG IS DESIGNED TO CLEAN ITSELF.

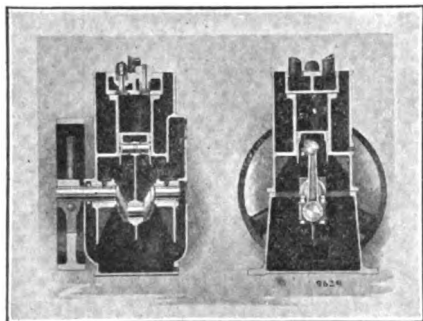
Many devices have been invented with which to clean sparkplugs, but it remained for a Toledo inventor, Hubert A. Myers, to design and produce a sparkplug which is said to effectually clean itself.

The accompanying sectional view of this new plug will show how the cleaning is accomplished. The plug is made with a special size inner chamber, in which a number of little porcelain pebbles are placed. With each impulse of the engine, either compression or explosion, these little pebbles are forced up and down in the inner chamber with the result that their rough surfaces completely cut away the soot, oil and carbon and keeps the insulator and inside walls entirely clean of any deposit. This, of course, insures a perfectly operating sparkplug so long as the necessary charge of current comes from magneto or battery in the usual way.



NEW INGERSOLL-RAND AIR COMPRESSOR PUT ON MARKET.

At the outbreak of the war there was a sudden call for a large number of small air compressors and the Ingersoll-Rand Company's offer to produce Imperial fourteen compressors was accepted. The field performance of these built-on-hurry-order machines proved them efficient, reliable and inexpensive to operate.



Imperial Air Compressor.

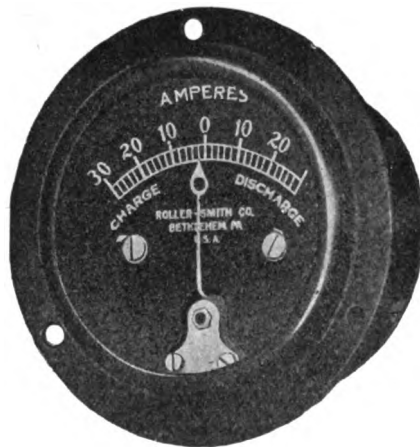
Now these machines have been placed on the general market. There are four sizes and the capacity range runs from three to 45 cubic feet per minute at pressures to 100 lbs. per square inch. The small compressors can, however, be used for pressure requirements up to 200 lbs. per square inch, the horsepower needed being, of course, slightly increased. They are single acting machines of the vertical type built for belt drive.

The smallest size is built with ribbed cylinder for air cooling where the service is intermittent and with water cooled cylinder of the reservoir type for continuous operation. Larger machines are water cooled only, employing the reservoir jacket system except that, in the case of the largest size, a closed jacket for connection to pressure system is optional.

In general design the Imperial fourteen compressors remind one strongly of an automobile engine. There is the same drop forged crank shaft and connecting rod, the die cast renewable bearings, the automatic splash lubrication system and general ruggedness and simplicity which have come to be recognized as guarantees of satisfactory service under all sorts of operating conditions. Trade prices and full details will be sent to tradesmen who write to the Ingersoll-Rand Co., 11 Broadway, New York City, mentioning the American Garage and Auto Dealer.

ROLLER-SMITH AMMETER APPLIED TO ALL MAKES OF CARS.

The Roller-Smith Co. states that its Universal ammeter for use in connection with electric lighting and starting systems on automobiles can be applied to all makes of cars, all makes and types of lighting and starting systems, and all voltage systems. With all the different makes of cars on the market, and the varying voltage systems with which they are equipped it is a difficult matter for an automotive tradesman to recommend a suitable ammeter to a car



Face of Universal Ammeter.

owner. The main trouble is that the ordinary ammeter designed for lighting circuit work will not operate under conditions where the ammeter must be installed in the cranking circuit such as, for instance, on some cars where a single unit, single wire type of system is featured.

With a Roller-Smith Universal ammeter it does not make any difference what make and type of car and system is installed as the instrument will operate satisfactorily under any conditions, having been particularly designed for cranking circuit use. The ammeter is of the flush type and is finished in black. Each instrument is furnished with full supply of mounting screws, nuts and washers.

Trade prices and full particulars can be obtained by writing to the Roller-Smith Co., 233 Broadway, New York City, mentioning the American Garage and Auto Dealer.

NORWESCO FIRM BRINGS OUT TWO NEW TUBE PATCHES.

The Northwestern Chemical Co., Marietta, Ohio, has added to its Norwesco "chemically correct" line of automotive utilities



two self-vulcanizing tube patches, Rubback and Khaki back. Rubback tube patch is manufactured under a special process that insures a perfect repair. This patch is designed for repairing both punctures and blowouts, and expands with the tire, preventing tendency of pulling loose when tire is inflated. Khaki back tube patch is made from the same character and quality of materials as Rubback, except that it is reinforced by a covering of khaki cloth. This patch is especially effective where a non-stretching repair is necessary. These patches can be applied either in the owner's garage or as an emergency when on the road. Efficient for not only tubes but all articles made of soft rubber. They are packed in screw top containers, two sizes.

RADIATORS MADE AND REPAIRED

Ship your Radiator to us today and get it back in 24 hours.

Written guarantee with every job.

Detroit Auto Radiator Co.
180 Fifth Street Milwaukee, Wis.

ANDRE G. CATELAIN

Everready Automatic Engine Starter. General machine work for foreign and American cars. Welding of all metals. Manufacturer Catelain Hose Coupling.

1446-8 Indiana Ave.

Chicago, Ill.

Hydraulic Arbor Presses

work easier than any others.

We make many sizes for many purposes.



WRITE FOR CATALOG

Lourie Manufacturing Co.
SPRINGFIELD, ILL.



Tire Applying Press

The AUTOMATIC and the REPEATER GREASE and OIL GUN

Improved self measuring meter—absolutely accurate. Can furnish either in Air Pressure, or Crank Operated

Used by U. S. and by nearly all Motor Car Manufacturers and by thousands of Garagemen.

Capacity 25 lbs., 50 lbs. and 100 lbs.

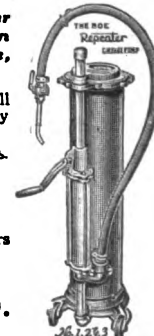
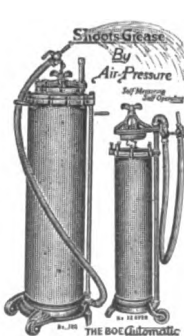
Saves Time

Saves Lubricant

Sold by over three hundred jobbers and wholesalers.

Write to us about it.

H. M. BOE MFG. CO.
Minneapolis, Minn.



BRING THESE PROSPECTS TO YOUR STORE

There are thousands of Ford owners that are passing your place every day to whom you could easily sell the Burgess "Triple Duty" Rebound Check and Shock Absorber.

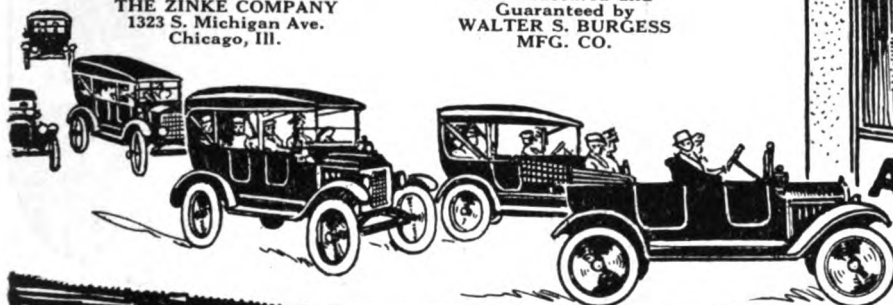
It's just the thing they are looking for—three devices in one—a comfort maker, a tire and gas saver.

A shock absorber that does what others claim. Backed by an ironclad guarantee for perfect satisfaction.

Write us today for full particulars of our attractive dealer proposition.

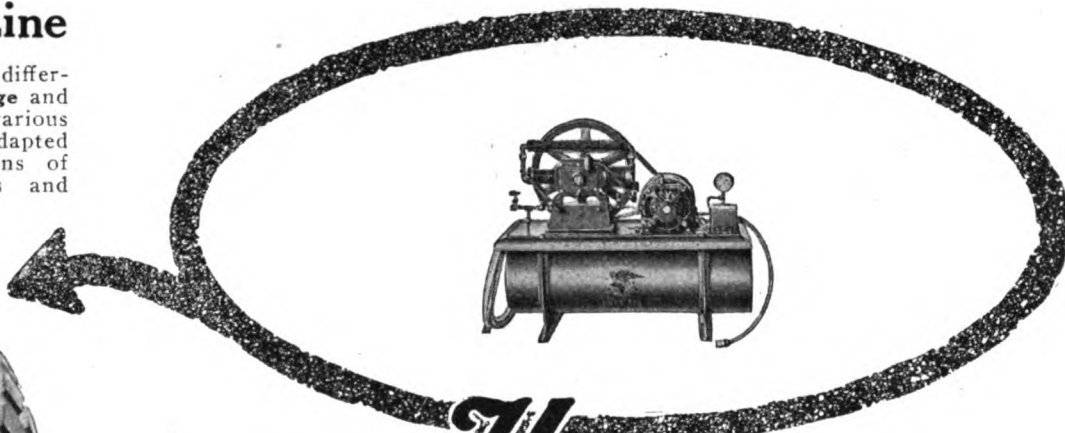
Sales Department
THE ZINKE COMPANY
1323 S. Michigan Ave.
Chicago, Ill.

Manufactured and
Guaranteed by
WALTER S. BURGESS
MFG. CO.



The *Usaco* Line

Comprises more than 20 different numbers in **Two Stage** and **Single Stage** Types and various individual equipment adapted for forming combinations of almost unlimited kinds and capacities.



The *Usaco* AIR COMPRESSORS TRADE MARK is the
AIR COMPRESSOR which solves
high pressure problems

The frequent need to deliver upwards to 140 pounds pressure instead of 60 to 80 pounds and operate under these trying conditions a larger percentage of the time than formerly, are two new conditions that confront an air compressor today. Therefore, if a machine is to deliver the kind of service required, for a sufficiently long period of time to justify its purchase, this machine must be designed specifically for high pressure work with every detail capable of standing the hard, continuous strain.

The Usaco De Luxe Automatic Air Unit was always sold as a superior compressor, but it took

the grueling test of war to prove how much superior it is to all others. The De Luxe, with its Two Stage principle and 14 points of superiority was the machine adopted by the Government after exhaustive tests, for the unprecedented hard service in camps here and abroad—it is the unit found in a majority of the best garages and filling stations—it is the machine which delivers maximum service for every dollar invested—it is a compressor without an equal.

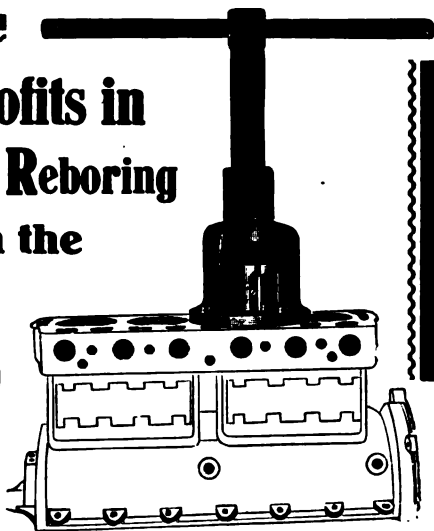
We will prove these facts to your satisfaction or make good our most unusual guarantee.

6542 Carnegie
Ave.

The United States Air Compressor Co.

Cleveland
Ohio

Big Profits in Cylinder Reboring with the DAVIS REBORING JIG and REAMER



You can rebores old Ford cylinders, and by getting new pistons (1-32 inch oversize) you can make an engine as good as new. This is no exaggeration—old cylinders being thoroughly "seasoned out" are actually superior to new ones.

There is a big demand for this class of work among Ford owners and as soon as you are known to have the equipment, you will get your share.

With a Davis Reboring Jig and Reamer, one man can rebores a set of four cylinders in 60 minutes, and do as good a job as the large shops. And you make a good profit.

We also make a milling attachment for drill press.

Write today for particulars.

HINCKLEY MACHINE WORKS, Hinckley, Ill.

GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company

1002 Washington Boulevard
Chicago, Illinois



"AM-PĒ-CO" PRODUCTS

Sell readily because their superiority
is well known to the Motoring Public

"AM-PĒ-CO" PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. "AM-PĒ-CO" Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes.

We also make the famous "AM-PĒ-CO" WHEEL PULLERS and BRAKE SHOES, both one- and two-piece.

If your jobber does not handle "AM-PĒ-CO" Products, write us direct.

F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

General Selling Agent for

**American
Machine
Products
Co.**

Marshall-
town,
Iowa



**For Soldering work on the big truck
or car NOKORODE is the handiest
to use—**

Irrespective of the sort of soldering job you have, NOKORODE will do it the best. It is a time and labor saver in the garage. Ideal for delicate work. Solders all metals but aluminum. Used by majority of passenger car makers, and by hundreds of garages. It will pay you to try it.

Sample and prices on request

The M.W. Dunton Company
PROVIDENCE, R.I.
U.S.A.



**Introducing the
Latest Idea**

ROTARY AIR COMPRESSORS

For All Purposes

ADVANTAGES WORTH CONSIDERING

Slow Speed. No Vibration. Positive Displacement.
High Overall Efficiency. Very Low Cost of Upkeep.
No Expensive Foundations.

Easy to Install. Perfectly Balanced. Quiet in Operation.

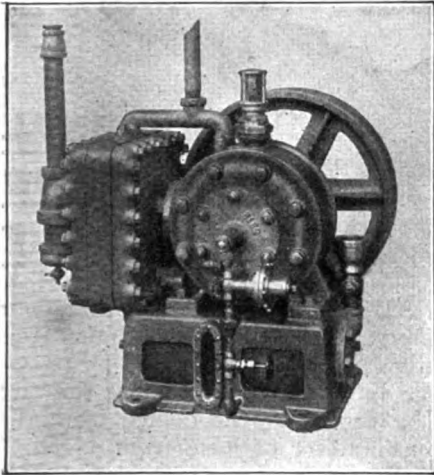
Check Valves on Discharge. No Valves on Intake.
Simple to Operate.

*Weighs Less Than One-Half of Other Types.
All Bearings Hyatt Roller—"High Duty." Only
Five Moving Parts Always Running in Oil.*


Write for Descriptive Matter, Prices and Delivery

JACKSON COMPRESSOR COMPANY

Denver, Colorado, U. S. A.



Rotary Garage Compressors



ROSE TIRE PUMPS

outsell other pumps on the market today.

Correct design, quality, material, and workmanship make the

ROSE


superior to all other pumps.

Seamless steel barrel will not dent.
Solid steel top and base will not break.
Patent valve admits more air to the barrel.
Cupped leather tanned under a secret process.

THE ROSE IS A FIVE YEAR PUMP

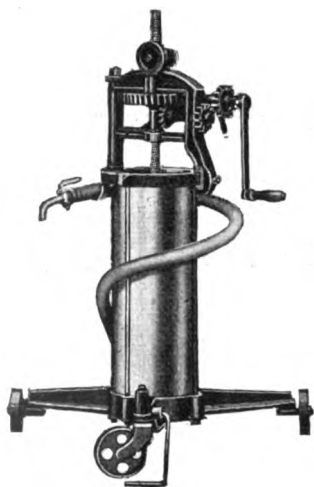
Rose Tire Pump $1\frac{1}{4}$ " barrel.... \$3.00
Rose Tire Pump $1\frac{1}{2}$ " barrel.... 3.50

*Handled by most jobbers
and dealers.*



THE
BEST-EARTH
THE ROSE
TIRE PUMP
THERE'S REASON
IT'S THE PATENT
VALVE
MORE AIR
LESS WORK
LESS CARE

MFG & GUARANTEED BY
J.H. HANEY & CO
HASTINGS NEB.



Ekern Portable Garage Grease Gun, Model N.

Business thrives when they're around

People invariably patronize garages which give honest service. If you have either an

EKERN MODEL N or MODEL K PORTABLE GARAGE GREASE GUN, your sales of grease or oil will be publicly registered.

Portable, practical and clean guns.

The EKERN is the only hand operated gun on the market that will work any weight of grease as well as oil.

Model K holds 20 lbs. grease or 2½ gals. oil.
Model N holds 56 lbs. grease or 7 gals. oil.

So that you may become better acquainted with the "money-making" advantages of PARO specialties send for copy of our new booklet.

Your regular jobber can fill your order.

H. G. Paro Co.

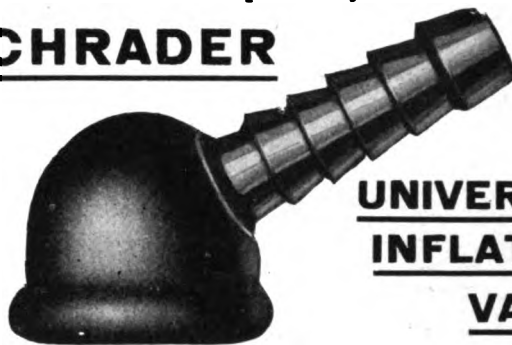
1412-14 South Michigan Boulevard, Chicago, Ill.

No wasted "Free Air"

SNAP! When the inflating valve is removed the AIR PRESSURE STOPS

All garages and repair shops distributing free air can profitably use the

SCHRADER



**UNIVERSAL
INFLATING
VALVE**

If you have a SCHRADER valve you know that your "bottled air" is safely tucked away the minute it is taken off the tire valve. The air is released by pressing the nozzle of the inflating valve against the tire valve, and stopped by removing the device from the tire valve. Fits any diameter of hose from ¼ to ¾ inch. Price, \$1.50.

A. SCHRADER'S SON, Inc.

783-793 Atlantic Ave., Brooklyn, N. Y.

May we show how profits can be increased.

STORM
CYLINDER REBORING MACHINES



Storm Cylinder Reboring Machine

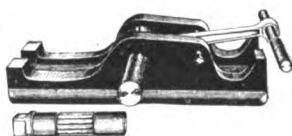
OF course you are interested in getting the maximum profits out of your repair business. You owe it to yourself to investigate a line of equipment that is saving time, labor and money in hundreds of repair shops.

Our line includes the
STORM Cylinder Reboring Machines
STORM Piston Vise
STORM Valve Port Renewing Outfit
STORM Connecting Rod Bearing Reamer, Jig and Straightening Gauge.

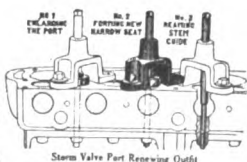
Write today for catalogue giving us your jobber's name

STORM MFG CO.

1714 4th St. THOMPSON, IOWA



STORM Connecting Rod Bearing Reamer, Jig and Straightening Gauge.

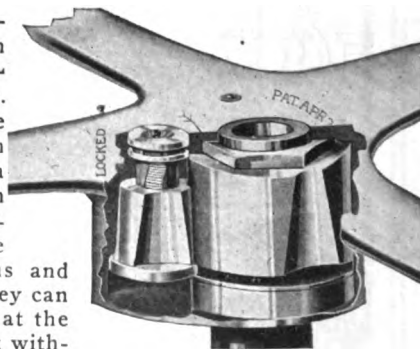


Storm Valve Port Renewing Outfit

"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."



Approved by the Underwriters' Laboratories, and affords 15% discount on insurance.

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

Write today for particulars.

THE RELIANCE COMPANY

411-417 So. Sangamon St.,

CHICAGO, ILL.

Distributors in every state

CYLINDER RE-BORING

It's the Summer Service that Counts

Service which adds pep to sick motors—restores 100 per cent compression in the engine—makes the motor easy to start—does away with the metallic knock.

Service at the season of the year when the car is on the go—Service that helps keep it going—that returns the car from your shop to the owner in the shortest possible time—

That's the kind of service that owners of MARVEL CYLINDER RE-BORING MACHINE No. 5 render their customers the service which adds a nice profit to their bank balance and makes real friends of their customers.

Service in the Summer Is The Service That Counts

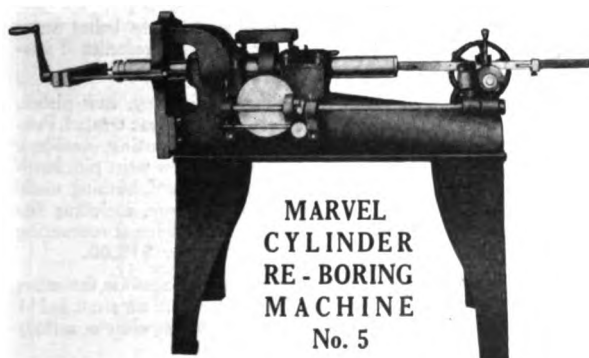
When the sky is blue—the air is pure—in the sunshine or the moonshine—day or night—that's the time for real joy—real pleasure with a car—the time when the owner will put off needed repairs until the last moment.

Install a Marvel No. 5 in your shop at once—let your customers see what a marvelous machine it is for quick and economical work—explain what it means to them to have a Marvel on the job.

Don't put it off—write at once for our proposition—let us show you how we help you get the business—how easily and quickly you can re-bore engine cylinders and fit with Marco Over-size Pistons.



The Marvel No. 5 will soon pay for itself—after that it's all velvet—write today.



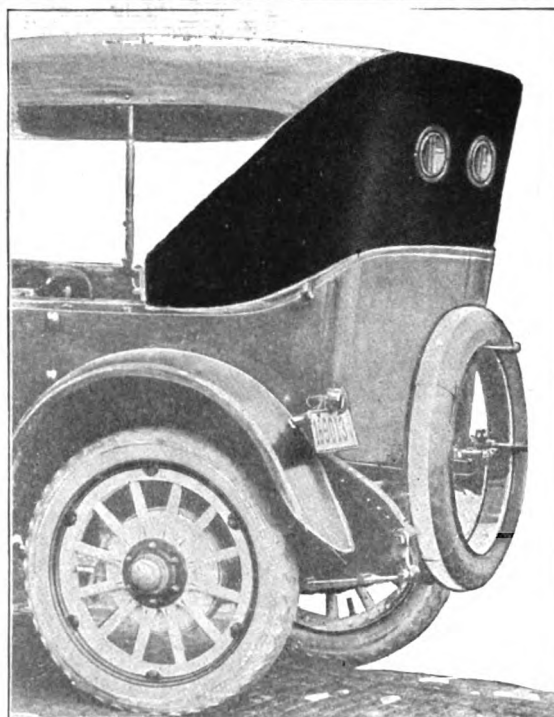
MARVEL
CYLINDER
RE-BORING
MACHINE
No. 5

MARVEL MACHINERY COMPANY

1307 S. Third Street

Minneapolis, Minn.

In Writing Use Address in Full—It Expedites Delivery



Badger

**BACK
CURTAINS**

With Plate Glass Windows

The very latest, classiest Back Curtain ever put out. Pierce-Arrow effect. Rich plate glass windows. Gives touch of distinction that makes motorists eager purchasers.

Heavy demand. Splendid profit allowance to dealer. Pays royal return on small stock investment. Write today for Dealer's Proposition—and ask for catalog of

BADGER SEAT COVERS

Most complete line on the market. Highest quality procurable. Prices that out-bargain those asked for inferior makes. Endless selection of beautiful fabrics and colorings. Guaranteed fit. All makes of cars. Extensively advertised.

BADGER SLIP ROOFS

Simplest, most serviceable of all. Cut by car manufacturers' patterns. Certain fit. Supplied complete. Tacked on in few minutes' time. The peer of tops. No competition in quality, convenience or cost.

BADGER TIRE COVERS

Another big BADGER value. A most attractive cover made of most serviceable materials. Highly skilled workmanship. Extreme care in making. A cover that stands the racket—at prices that give you sales security.

Get acquainted with the entire BADGER Line. The most active of accessories sellers.

Wisconsin Auto Top Co.

2 MAIN STREET,

RACINE, WISCONSIN



**Its a happy
garageman
who has a
HOLMES
WRECKING
TRUCK**

This advertisement actually expresses the attitude of hundreds of garagemen and repairmen who have a **HOLMES WRECKING TRUCK**.

Regardless of the wrecked condition of the car, it can be readily "towed in" with a **HOLMES**.

Staunchly built, frame and wheels of malleable iron castings, Hyatt roller bearings for wheels and tongue of second growth ash.

PRICE, \$50.00
Special Discounts to Garages and Dealers.

ROBERT HOLMES & BROS.
DANVILLE, ILLINOIS



Your Repair Jobs Can
Be Charged Correctly

**The Calculagraph is a necessary
part of the repair department
of every up-to-date Garage.**

With the **CALCULAGRAPH** any garage knows where it stands. Never is there occasion for dispute, as the **CALCULAGRAPH** records when the job is started—when it is ended—and it **gives the elapsed time**. Thus it eliminates all chance of error—pleases the public and makes "more" money for the garage.

Garage Booklet on Request

DEPT. 77

THE CALCULAGRAPH COMPANY
30 Church Street NEW YORK CITY



**Have You Tires
SAND BLISTERED?
BLOWN OUT?
PUNCTURED?
RIM CUT?**

**Good for another
5000 miles**

We "Remake" old tires by a process that gives them at least 5000 additional miles.

**Theres good profit
in it for you.**

Send us the old tires that accumulate in your shop. After we remake them, you can sell them at a price which will interest your customers—and at good profit to yourself.

Write today for particulars.

Leo McDaniel Rubber Co.
804 Commercial Ave.
CAIRO, ILL.

Pondelick Brothers

will pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder reground, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

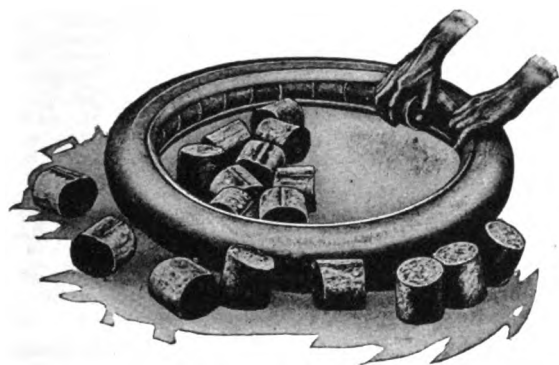
How You Can Conserve with National Rubber Tire Filler

More Miles Per Tire—Less Tires to Buy and No Buying of Tubes at All.

During the period of the War we learned to conserve in many ways—Food, Fuel, Farm-stuffs, Man-power and Transportation Facilities were first. The use of

National Rubber Tire Filler

offers you a medium for continuing to conserve without any sacrifice whatever.



Motorists Have No Tire Trouble Who Ride on This Perfect Substitute for Air

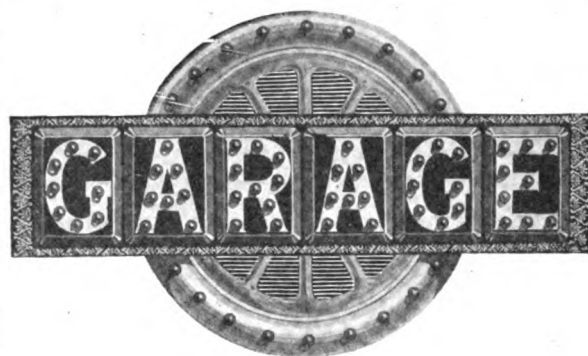
Rim-cut-proof, blowout-proof, puncture-proof tires are now a reality. Motoring is now freed from the shackles of tire trouble, and is made safe, comfortable and enjoyable.

National Rubber Tire Filler replaces the inner tube. It has all the resiliency of an air-filled tire with none of its disadvantages. It lasts indefinitely—40,000 miles or more. It has been in use for seven years and has conclusively proven its superiority and economy over air-filled tires. Our factory taxed to capacity is proof positive of its great popularity.

It rides as easy as air.
It cannot puncture or blowout.
It can be used on all style tires.
It doubles tire mileage.
It is easily installed.
It stimulates motoring.

National Rubber Filler Company
210 College Street Midlothian, Texas

*"The 24 hour a day
Salesman"*



The
**Federal Electric
Sign**

The beautiful Federal porcelain enameled steel sign not only glistens in the day time but sparkles at night. It is constantly inviting new as well as old customers to trade with you. It attracts motorists from every direction as well as from the cross streets. It tells them that you are ready to give real service.

YOU HAVE 12 MONTHS TO PAY

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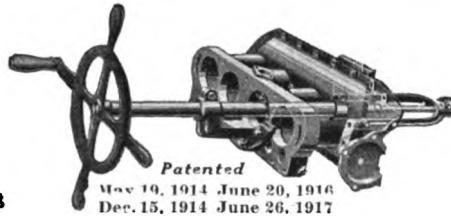
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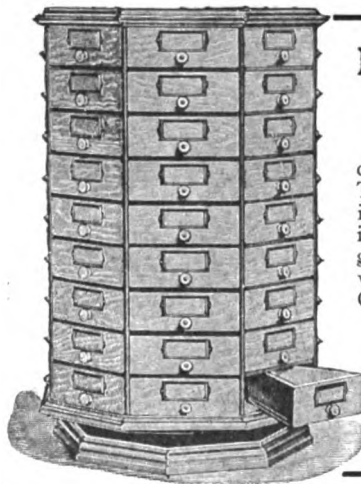
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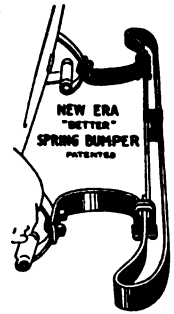
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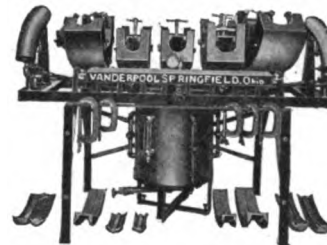
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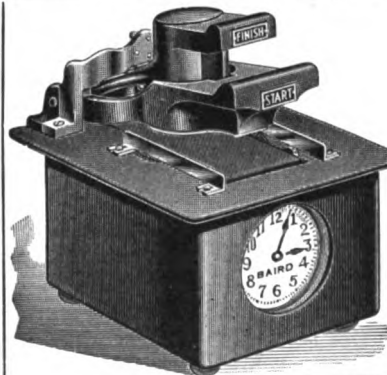
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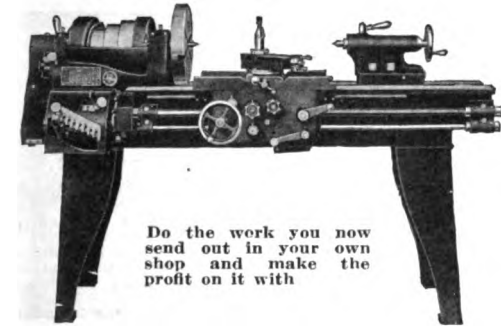
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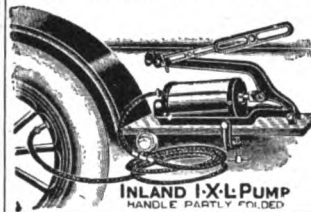
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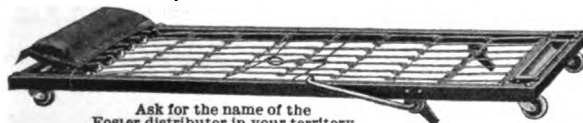
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WRENCHES

The Graham Roller Bearing Co., Coudersport, Pa.

Index to Advertisements

| A | | J | |
|----------------------------------|----|----------------------------------|----|
| Advance Automobile Access- | 5 | Jackson Compressor Co..... | 51 |
| ries Corp. ....3 and | | Jenkins Vulcan Spring Co..... | 25 |
| Akron Rubber Mold & Machine | — | Jewell Electrical Instrument | 61 |
| Co. | | Co. | |
| American Accessories Co..... | 59 | K | |
| American Bolt & Screw Case | 56 | Kennedy Car Liner & Bag Co.. | |
| Co. | | 59 | |
| American Machine Products Co. | 50 | L | |
| American Technical Society... | — | Lawrence & Co., L..... | |
| Atlas Auto Supply Co..... | — | 59 | |
| Auto Compressor Co..... | 31 | Lourie Mfg. Co..... | |
| Auto Engine Works..... | 58 | 48 | |
| Auto Parts Co..... | 58 | M | |
| Auto Spring Repair Co..... | 59 | McDaniel Rubber Co., Leo.... | |
| Auto Wrecking Co..... | 58 | 54 | |
| B | | Marvel Carburetor Co..... | |
| Baird Equipment Co..... | | 23 | |
| Beck & Corbitt Iron Co..... | | 53 | |
| 59 | | Marvel Machinery Co..... | |
| Bermo Co., A. J..... | | 53 | |
| B. & M. Mfg. Co..... | | — | |
| Boe Co., H. M..... | | Mechanical Belt Co..... | |
| 48 | | — | |
| Brunner Mfg. Co..... | | Miami Trailer Co..... | |
| 43 | | 62 | |
| Buettner Co., Chas. H..... | | Monarch Machine Tool Co..... | |
| 59 | | — | |
| Butler Mfg. Co..... | | Mueller, R. & S. Co..... | |
| 58 | | — | |
| Burgess Mfg. Co., W. S..... | | 49 | |
| C | | N | |
| Calculagraph Co..... | | National Cash Register Co.... | |
| 54 | | 45 | |
| Cassidy Co., Edward A..... | | National Rubber Filler Co.... | |
| 29 | | 55 | |
| Catalain, Andre G..... | | National Wire Wheel Works.. | |
| 48 | | 37 | |
| Champion Pneumatic Machinery | | New Era Spring and Specialty | |
| Co. ....Inside Back Cover | | Co..... | |
| Chicago Baling Press Co..... | | 56 | |
| 59 | | New York Coil Co..... | |
| Chicago Solder Co..... | | — | |
| 33 | | No-Leak-O Piston Ring Co.... | |
| Curtis Pneumatic Machinery Co. | | 59 | |
| 23 | | Norma Company of America, | |
| D | | The | |
| Dayton Electrical Mfg. Co.... | | 6 | |
| — | | O | |
| Denby Motor Truck Co..... | | Owens, Frank Chas..... | |
| 7 | | 58 | |
| Detroit Auto Radiator Co..... | | P | |
| 48 | | Paro, H. G., Co..... | |
| Dunton Co., The M. W..... | | 52 | |
| 50 | | Phillips Engineering Co..... | |
| E | | 56 | |
| Eccolene Company | | Pondelick Bros..... | |
| Ever-Tight Piston Ring Co.... | | 54 | |
| 62 | | R | |
| F | | Rollance Co. | |
| Federal Sign System (Electric) | | 52 | |
| 55 | | Romort Mfg. Co..... | |
| Flexlume Sign Co.....Back Cover | | 39 | |
| Foster Bros. Mfg. Co..... | | S | |
| 59 | | St. Paul Auto Cylinder Grind- | |
| Franklin Mfg. Co..... | | — | |
| G | | ing Co. | |
| Ganschow Co., William..... | | 58 | |
| 50 | | Schrader's Son, Inc., A..... | |
| Garden City Spring Works.... | | 52 | |
| 61 | | Shaler Co., C. A.....Front Cover | |
| General Utility Company..... | | 59 | |
| 4 | | Spencer's Sons, I. S..... | |
| Gill Mfg. Co..... | | 58 | |
| Globe Mfg. Co..... | | Standard Auto Salvage Co.... | |
| 47 | | 8 | |
| Graham Roller Bearing Co., | | States Chemical Co..... | |
| The | | — | |
| Gray-Heath Co..... | | Stewart, F. W..... | |
| — | | 52 | |
| Greer College of Motoring..... | | Storm Mfg. Co..... | |
| 58 | | — | |
| H | | Strickler, T. H..... | |
| Halladay Co., L. P..... | | — | |
| 27 | | Sunderland Machinery & Sup- | |
| Haney & Co., J. H..... | | ply Co. | |
| 51 | | 58 | |
| Hartson & Co., Inc., Thos. J.... | | T | |
| 41 | | Times Square Auto Supply Co. — | |
| Harvey Spring & Forging Co.... | | U | |
| 56 | | Universal Battery Co..... | |
| Helsper Special Tool Co..... | | — | |
| 50 | | Universal Mfg. & Sales Co..... | |
| Hinckley Machine Works..... | | 52 | |
| 57 | | U. S. Air Compressor Co..... | |
| Hobart Bros..... | | 49 | |
| Hoffman Mfg. Co., Andrew..... | | Utilities Company | |
| — | | 4 | |
| Holmes & Bros., Inc., Robert.. | | Utilities Sales Corp..... | |
| 54 | | — | |
| Howell Co., The W. H..... | | 57 | |
| 57 | | V | |
| I | | Vanderpool Vulcanizing Co.... | |
| Inland Machine Works..... | | 56 | |
|Inside Front Cover | | W | |
| Zinke Co. | | Wagner Specialty Co..... | |
| 39 and 49 | | 59 | |

AUTOMOBILE SPRINGS
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago



As your speedometer tells you your speed, the Jewell tells the condition of your battery

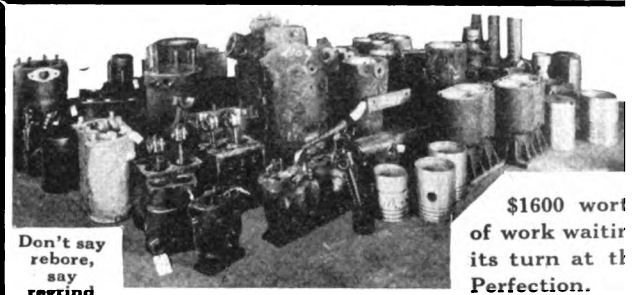
Tells you at a glance, the exact condition of your battery. Protects it from short circuits, failure of charging currents on low water. Eliminates repeated messy hydrometer tests.

Ask your dealer or write to us.

JEWELL ELECTRICAL INSTRUMENT COMPANY

1650 West Walnut Street, Chicago

Exclusive Sales Representatives, Gray-Heath Co.,
1440 Michigan Avenue, Chicago



Cylinder REGRINDING A Money-Making Business

The shop that will install a PERFECTION CYLINDER GRINDER and will go out after this business will easily clean up

\$100.00 a Day Profit

in regrinding cylinders and refitting oversize pistons and rings, together with sale of oversize pistons and rings.

The "PERFECTION" attached to an ordinary lath costs about one-fifth as much as the heavy machine and turns out more and better work.

REGRINDING is so much better than reboring the customers become unceasing boosters; and reboring "goes out" wherever REGRINDING comes in.

Send for our Perfection catalog. Better telegraph

Send for our circular

Wood & Safford Machine Work
51 Twelfth Ave., North, Great Falls, Mont



FARMER

SMALL
TOWN
MERCHANTPUBLIC
UTILITY
COMPANIESLUMBER
DEALER

Substantial Profits Will Pour in if you sell MIAMI TRAILERS

When you attempt to classify the number of possible buyers of MIAMI TRAILERS, you will be astonished at the diversity of sales you can make.

This is one of the biggest arguments in their favor.

Practically anybody who has either an automobile or truck—and delivering or hauling to do—will be impressed with MIAMI TRAILERS because of their moderate purchase price—and efficiency.

Just give us an opportunity to show you that you can make "substantial profits"—merely write us and say YOU are interested—and later you will thank us that you did.

**THE MIAMI
TRAILER CO.**
TROY, MIAMI OHIO



Have you a "Piston Ring Primer" in your pocket? It has 16 pages of valuable information. Free to you.

Zelnicker EVER-TYTE Piston Rings—they just naterally make you an Optermist.

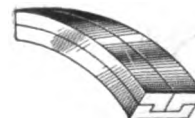
MANUFACTURED BY

The Ever Tight Piston Ring Company

3124 LOCUST STREET

AG&AD 4-19

ST. LOUIS, MO.



RIGHT ANGLE
INTERLOCK

Ever-Tyte Bill

Says:- Well, here I am again—I'm gettin' as gabby as an old fish-woman, but I got to get it out o' my sistern.

These days you see an' hear tell o' so many fellers in our line o' bizness, standin' up on their hind legs, cryin' about their bizness is shot to pieces,—what's goin' to happen now that the war is over?—their cozzen's got the Floo—their dog's got the mange,—and things in general has gone to rack and roon, to hear 'em tell it.

A lot of these same birds has got money in the bank, Liberty Bonds tucked away under the mattress, a fine happy fambly at home, and is smokin' two-bit segars.

It sure riles me to here these guys speel,—it's just plane cold feet—there's some guys just got to have things handed to 'em on a gold platter.

If a few of these here pessermists would get out and dig and figger and plan fer the big bizness that's got to be took care of now that we finished mussin' up the apposel o' kultur, they'd be a dam site better off—This thing called Optism is mighty handy to have around—it pulls a guy thru a many tite place—I'm fer it, and fer

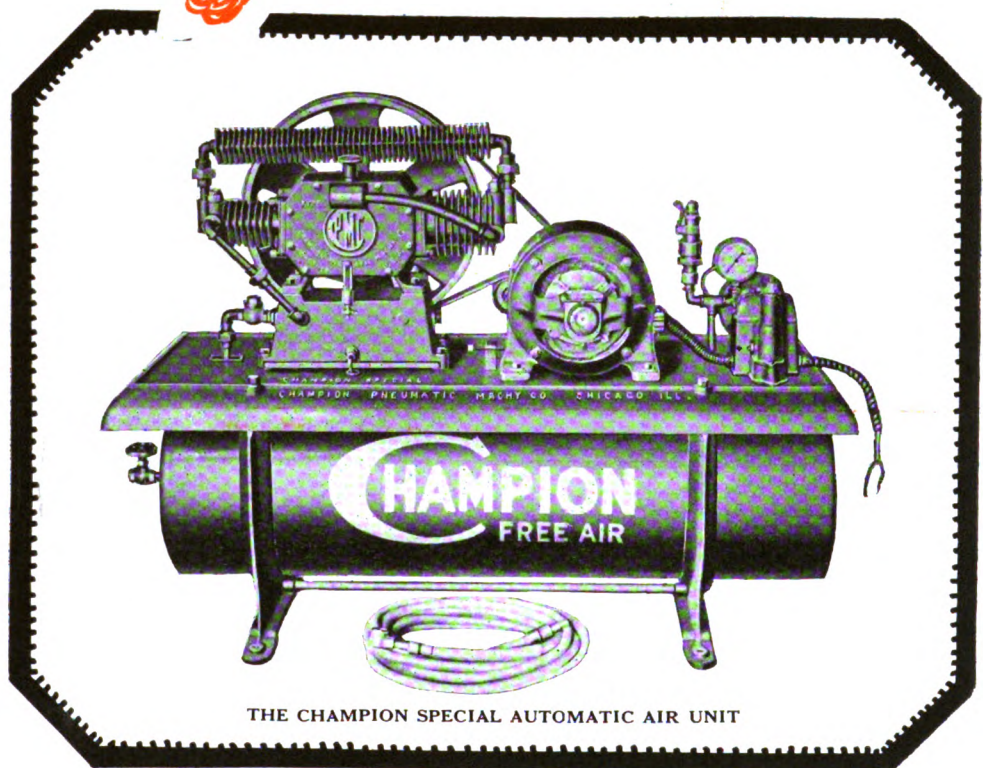
The CHAMPION Air Compressor

Speedy
Powerful
Dependable

The CHAMPION SPECIAL, TWO STAGE AUTOMATIC UNIT was developed by constant study and experience of the finest engineers in the Air Compressor industry.

The sturdy and substantial perfectly balanced Champion fulfills in performance all that is claimed. It has the reputation of being an extraordinary Air Compressor, with a wonderful improvement in the introduction of valves that entirely eliminates the annoying springs, brass seats and ball checks commonly used in other Air Compressors.

OUTSTANDING QUALITY makes the Champion pre-eminent in the fine Compressor class. It will give you the most constant year round service.



THE CHAMPION SPECIAL AUTOMATIC AIR UNIT

To obtain a maximum return in the form of good will, you must have an equipment that will give rapid, reliable service under all conditions—The CHAMPION does this.

With the above facts in view, the CHAMPION AIR COMPRESSOR should appeal to you strongly.

10 EXCLUSIVE MECHANICAL FEATURES:

1. Annular Ball Bearing Crankshaft.
2. Cylinders and Valve Heads Cast Integral.
3. Pressure release Automatically releases oil and water from base of Compressor.
4. Connecting Rod Bearing, Bronze Back Babbitt Lined.
5. Mushroom valves in Bronze Cages. (Special arrangement for regrinding).
6. Removable Cylinders easy for inspection.
7. Fan Blade Fly Wheel.
8. Drop Forged Crankshaft.
9. Hollow wrist pin, hardened and ground, securely fastened in piston.
10. All parts standard and interchangeable.



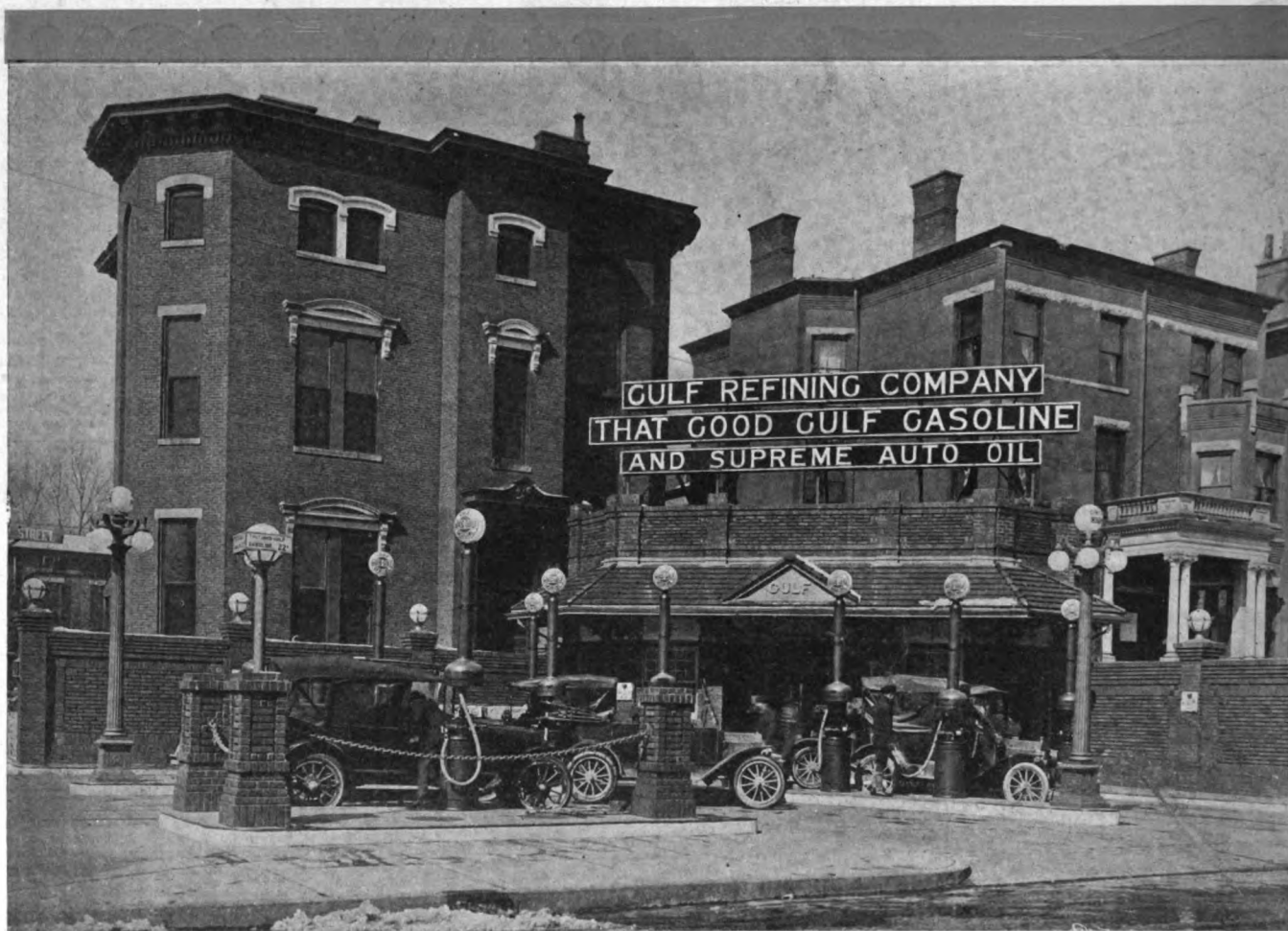
**The Champion Pneumatic
Machinery Co.**

*Manufacturers of the most complete
High Grade AIR LINE SPECIALTIES*

1402 S. Michigan Ave.

CHICAGO





Why the "Big Fellows" Standardize on Oplex Signs

THE Oplex sign in this picture is just one of many the merchandisers of "That Good Gulf Gasoline" have bought.

Why are they using Oplex Signs?

Simply because they have studied the sign market and found that Oplex signs are best.

That their raised, white letters on a dark background make them splendid day signs as well as night signs.

That they have greatest reading distance because the outline of their raised, white letters is unbroken.

That they can be operated with greatest economy—fewer lights, less replacements.

But most important of all—because Oplex Signs have a distinctiveness other signs lack.

That is why the world-known organizations—the "big fellows"—are buying them.

A sketch showing how your sign will look will come for the asking. Just give us some idea of your requirements and tell us the wording you want used.

THE FLEXLUME SIGN CO. Niagara St. & Potomac Ave.
BUFFALO, N.Y.

Pacific Coast Distributors:
Electrical Products Corp.
Los Angeles, Cal.

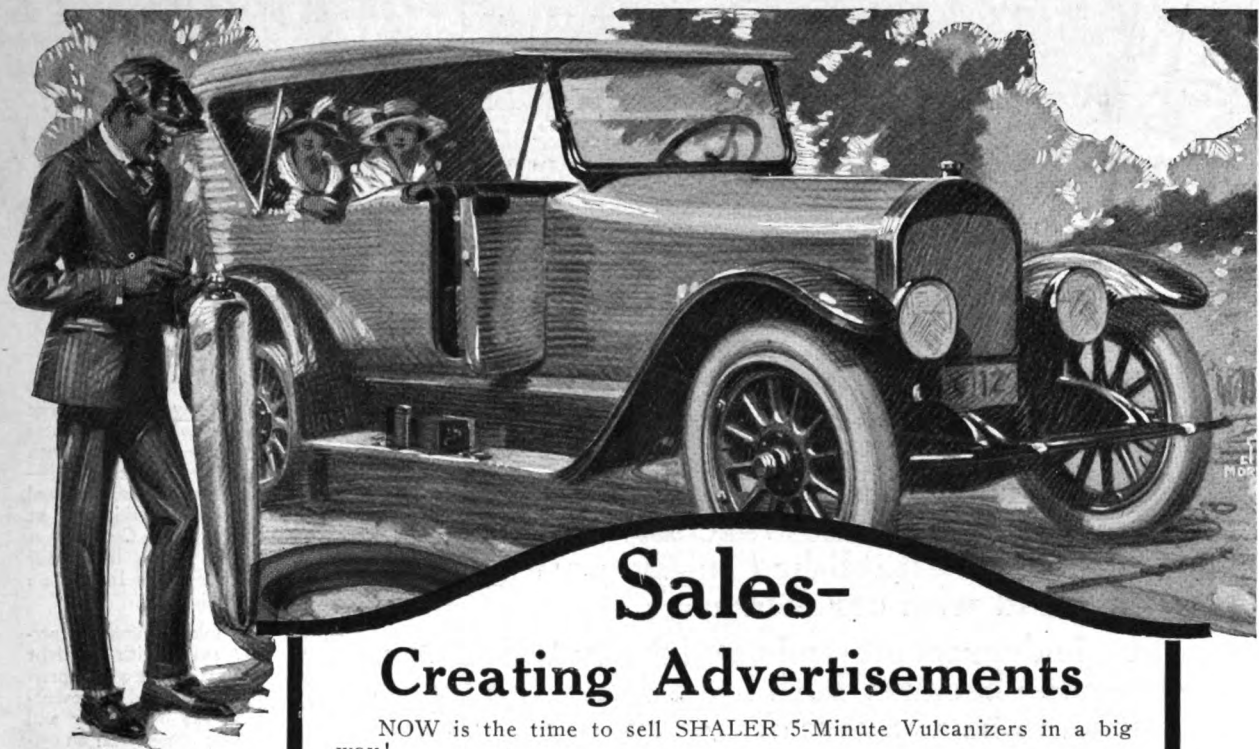
Canadian Distributors:
The Flexlume Sign Co. Ltd.
Toronto, Can.

American Garage & Auto Dealer

Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

JULY 1919

Vol. 10—No. 7
10 Cents the Copy
\$1.00 Per Year



Sales- Creating Advertisements

NOW is the time to sell SHALER 5-Minute Vulcanizers in a big way!

The big SHALER advertising campaign is running with large, forceful, full-page advertisements in all of the important national and motorists' magazines. These ads are creating a big demand.

NOW is the time for **you** to help "push" **your** sales by displaying SHALER 5-Minute Vulcanizers—and by demonstrating them to your customers.

SHALER 5-Minute Vulcanizer *Gives You Big "REPEAT SALE" PROFITS*

Dealers are enthusiastic about the SHALER 5-Minute Vulcanizer. It's easy to sell—one demonstration to the motorist quickly sells it—then you have a steady customer who comes back to you regularly to buy more Patch-and-Heat Units to use with this vulcanizer.

This gives you **Quicker Sales—and Double Profits.**

Order From Your Jobber NOW

Get the full benefit of our advertising. Replenish your stock—order 1 dozen or more SHALER 5-Minute Vulcanizers, packed in an attractive counter case. Put this case on your counter—or in your window—and watch it sell SHALER 5-Minute Vulcanizers for you.

C. A. Shaler Co., 356 Fourth St., Waupun, Wis.

Oldest and Largest Manufacturers of Vulcanizers in the World

*for Value
received*



The Inland *Spiral Cut* gives the Inland One-Piece Piston Ring those exclusive superiorities which have established Inland *prestige* with trade and with car owners.

The dealer recommends, and the motorist buys, Inlands—because both have found the transaction to be a *square deal* exchange of value-in-price for value-in-service.

Jobbers everywhere stock
Inlands—Order from yours.

Inland Machine Works, 1645 Locust Street, St. Louis, Mo.

Inland Values

Absolutely *gas-tight*. The Inland *Spiral Cut* eliminates the "gap," does away with the "step" at the ends—and gives *continuously* equal breadth and thickness at all points. Compression cannot escape from your cylinders with Inlands on your pistons.

The Inland *uncoils* in a perfect circle, with gas-tight contact and equal pressure all around—preventing loss of power and saving *uneven* wear on cylinder walls.

This exclusive, patented *Inland* construction prolongs motor life, increases motor efficiency, saves motor trouble—and gives *more* power on less fuel and oil.

INLAND

ONE-PIECE PISTON RING





Ford Owners wrote this ad — it's worth reading

Sold only in this package.
\$3 per set of three—Rockies
West \$3.25 — Canada
\$4.50.

Sure Brake

In the emergency my Cork Insert lining was there with a grip that held.

W. G. Yeager,
Lexington, N. C.

Advance Cork Insert

We have a sure brake at all times wherein the other ones were always worn out.

Victor Baker,
Hoosick Falls, N. Y.

Advance Cork Insert

You can stop so gradually that you can't tell when you're stopped if you don't watch something. But before using Cork Insert people would get up ready to get out and then the brake would take hold and nearly throw them against the windshield.

Wm. Douthett, Jr.,
Jamestown, Pa.

Advance Cork Insert

I never had such good brake service before and am recommending them to all my friends who own Fords.

Alfred Moger,
Gaastra, Mich.

Advance Cork Insert

Advance Automobile Accessories Corporation
Dept. G-7 56 E. Randolph St., Chicago

Smooth Action

Since using Cork Inserts I have none of that stuttering and shivering and I can even stop on a steep grade and start again by the pull of the motor alone.

John James,
Newtonville, Ala.

Advance Cork Insert

In starting off there is not that jerky motion as with the old linings when at their best. Also the brake and reverse take hold much better.

A. F. Richmond,
Williamsburg, Mass.

Advance Cork Insert

They are far ahead of the original linings that come with the car as they put a stop to all chattering in the transmission and differential and cause the engine to give more power on low gear.

Harold B. Robinson,
Elizabeth, W. Va.

Advance Cork Insert

We have grades up to 25% but since installing Cork Insert our Ford runs 100% smoother than when using old style linings.

Jno. R. Randolph,
Claremore, Okla.

Advance Cork Insert

Long Wear

Have used Cork Insert 8 months and they are working better than when they were first put in.

C. H. Robinson, Peru, Me.

Advance Cork Insert

Before using your Inserts I had to line my truck on an average of five or six times a season. I did not have to line the transmission at all last season and the Inserts were working just as good last fall as they were when I first put them in.

Ray A. Kingman, Ferrisburg, Vt.

Advance Cork Insert

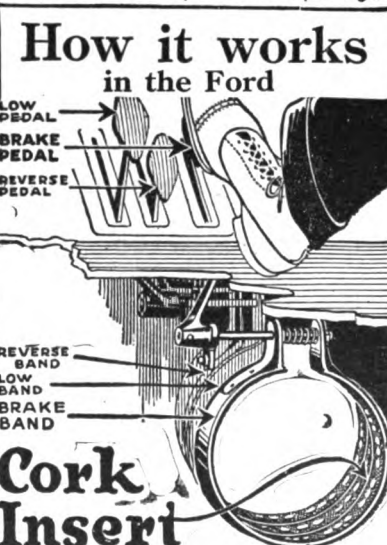
I have had Cork Inserts on my car for the last 8000 or 9000 miles, and like them very much.

Fred R. Stamm, Los Angeles, Cal.

Advance Cork Insert

Put Cork Inserts in last July and have run them about 6000 miles and they are working fine. I have always had to replace my bands at least once during the summer, but from the way these are working will not have to touch them.

H. C. Moore, Princeton, N. J.



Cork Insert

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



HAYWOOD'S LATEST INVENTION

Here it is:

A new machine that will earn from \$100.00 to \$150.00 per week in any well-established tire repair shop. More than one year of constant experimenting and development work was required to complete it.

Statistics say there will be **One Billion Dollars'** worth of tires worn out this year. The insistent demand for re-treaded tires that would add 3,000 to 4,000 more miles of wear is growing. A new and better machine than had so far been produced was needed.

HAYWOOD'S
Silvur Lined
MOLD

meets the need. Made of white metal—die cast—absolutely free from blemishes and smooth as glass. It is truly a wonderful machine.

Old tires retreaded on this machine closely imitate the runner, **cord type**, and are smooth, classy, bright. All 4,000 owners of Haywood Tire Repair plants will **want** this new Haywood invention. Owners of other plants should have one.

**PAYS FOR ITSELF
IN A WEEK**

Will earn from \$100.00 to \$150.00 weekly. Are you an auto tire repairman? If you are not, why not enter this profitable business? Tire repairmen earn **\$2,500 to \$4,000 per year**. Many are doing better; some up to \$6,000 and \$7,000 per year. If you have a tire repair shop you need this Haywood Silvur-Lined Retread Mold. You should write us at once and get the details. It will pay for itself in a week. Every week thereafter you should make \$100.00 or more extra profit.

FREE BOOK

I have an interesting book to send you that tells about tire repairmen and the Haywood method. It tells about automobile tires—it gives inside facts that you should know about profits. When you write tell me if you have a tire repair shop, or, if you want facts about the tire repair business. Address

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., INDIANAPOLIS, IND.

WRITE ME!

I will tell you how to start in business as an expert tire repairman and earn \$2,500 to \$4,000 per year. Sounds too good to be true. But it is true, every word of it.

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., Indianapolis, Ind.

(Mark an X for interest in either or both subjects)

- ☐ Send facts about the Silvur-Lined Mold.
☐ Send facts about the Tire Repair business.

NAME _____

ADDRESS _____

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

**SILVUR
LINED
RETREAD
MOLD**

N. E. Gibbard, Charlotte, Mich., owner of a Haywood plant, last year did a business of \$15,000. Charlotte is a town of 7,500 population.

ADVANCE **White Stripe** **TRANSMISSION LINING** **for FORD CARS**

Made SPECIALLY to meet Ford transmission service!

Before we made "White Stripe" we studied the Ford transmission in actual service.

Why do ordinary linings wear out quickly or get so hard as to be unserviceable?

The residue from "broken down" oil and from unburned fuel attack the lining, and under heat dissolve or wash out the treatment and expose the bare fabric to the ravages of heat and friction. No grade of fabric will long withstand such conditions without some protection.

That is what our chemists discovered and they produced the *White Stripe* treatment to meet this condition. White Stripe treatment does not "wash out." It stays in the lining and retains its velvety softness at all temperatures and under all conditions.

That is why "White Stripe" lining lasts longer and gives smoother, quicker braking service than any other plain lining. White Stripe treatment has actual wearing friction value in itself. It not only protects the fabric but helps to do the braking work.

You can easily identify White Stripe in boxes or in rolls. Every inch is marked with the white stripe.

ADVANCE AUTOMOBILE ACCESSORIES CORP.
 Dept. G-7, 56 East Randolph Street Chicago, Illinois

In boxes

\$2 per set of three
 Rockies West, \$2.25
 Canada, \$3

In rolls

32 cents per foot
 Rockies West, 35c
 Canada, 40c



Specially woven and chemically treated to withstand the severe service in Ford trucks and commercial cars.

"NORMA" PRECISION BALL BEARINGS

(PATENTED)



Conservation of resources, thrift in matters of saving and spending are still of prime importance to the nation's welfare. To save wherever possible, to spend only where necessary and, above all, to spend wisely—these are still obligations of good citizenship. Be sure that what you spend buys the utmost in service.

Cars, trucks, tractors, power boats are necessities — their purchase, when wisely made, is not an extravagance. And it is a fact which a little investigation will emphasize that the automotive units which today best exemplify the ideal of thrift are those carrying "NORMA" equipped magnetos and lighting generators.

**Be Sure—See That Your
Electrical Apparatus
is "NORMA" Equipped.**



THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings.

American Garage & Auto Dealer

Published Monthly

TABLE OF CONTENTS

| EDITORIAL | |
|---|----------|
| Work for War Tax Repeal..... | 9 |
| Your Trade Journal's Value..... | 9-11 |
| Prices Rising—Not Falling..... | 11 |
| Teach New Owners More Than Lever Shifting and Steering | 11 |
| Reducing Labor Turnover..... | 11 |
| GENERAL | |
| "They're Off! | 10 |
| Personality—The Measure of a Man, by Dr. J. M. Fitzgerald | 12-13-14 |
| If I Were an Automobile Dealer, by Lester G. Herbert | 14-15-16 |
| Army Motor Corps to Cross Country, by A. F. Bement | 16-17 |
| Dealers' Service Where Needed Most, by George S. Brown | 18 |
| Workers' Danger in Practical Jokes, by Chesla C. Sherlock | 19-20 |
| Plan Now for Winter Repair Work, by Robert Falconer | 20-21 |
| Automotive Equipment Show for Chicago..... | 21 |
| Use of Sales Ticket in Accounting..... | 22-23 |
| Prices Will Not Go Any Lower Down, by S. M. How. Government Not to Dump Surplus Cars and Trucks. Dealers' Paper Good at Federal Bank, by Harry G. Moock | 24-25 |
| Denby Truck Does Stunts During Tractor Test.... | 25 |
| Tire Repairer Does Big Business in Small Canadian Town | 46 |
| Silvur Lined Retread Mold Made by Haywood Firm. Shaler Makes Gang Vulcanizer for Repair Shops.... | 48 |
| Duracord Lamp Cord Designed for Strenuous Service. Air Pressure Regulator Replaces Dust Cap on Tires. Liberty Sparkplugs Announced to the Trade..... | 50 |
| Attractive Display Stand for Boyce Motometers.... | 52 |
| Ingenious Display Card Shows Bottle of Waxit.... | 54 |
| Truck Makers Converted by Trailers, by H. W. Perry | 54 |
| Ohio Trailer Company Produces Two New Models.. | 56 |
| Justice in Pasco Sales Head With Office in Detroit.. | 56 |
| New Storm Tool for Aligning Ford Main Bearings.. | 58 |
| Storm Manufacturing Company Moves to Minneapolis | 64 |
| Eccolene Mfg. Co. Reincorporates and Increases Capital | 64 |
| DEPARTMENTS | |
| Practical Hints for Shop Mechanics, by G. L. Shelley | 26-28 |
| Welding, Cutting and Brazing Practice, by David Baxter | 30-32 |
| How to Make the Shop Profitable, by E. B. Hinrichsen | 34 |
| Readers' Questions and Answers, by G. L. Shelley.. | 38-42 |
| Solutions for Mechanical Problems, by E. B. Hinrichsen | 44-46 |
| Facts and Ideas in the Tire World..... | 48-50 |
| Accessories—They Bring in Money..... | 52-54 |
| News of Manufacturers and Jobbers..... | 58 |
| Accessories and Garage Equipment..... | 60 |
| Buyers' Reference | 76 |
| Index to Advertisers..... | 77 |

Published on the 15th of each month by the
AMERICAN GARAGE & AUTO DEALER, Inc.
116 S. Michigan Avenue, Chicago, Ill.

J. R. HASTIE, *President and Treasurer*
H. D. FARGO, *Vice President* E. C. HOLE, *Vice President*
E. T. CLISSOLD, *Vice President* S. R. EDWARDS, *Secretary*

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S. J. BORCHERS, *Asst. Advertising Manager*.

Entered as second-class matter, March 1, 1916, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

Subscription per Annum (Postage Paid) \$1.00. Advertising Rates on Request.



The oval shows part of the post office fleet operating in Christiania, Norway. The other illustration, a 4 ton Denby owned by the City of Caldwell, Idaho.

HANDLING the mails in Christiania, Norway, or flushing the streets in Caldwell, Idaho—doing the most exacting tasks, the world over—Denby trucks are, day in and day out, giving dependable, economical service.

For Denby Trucks combine, in an unusual degree, the two prime requisites of good truck performance,—the ability to give continuous service under all conditions and to operate at a cost that makes them an investment that pays big dividends.

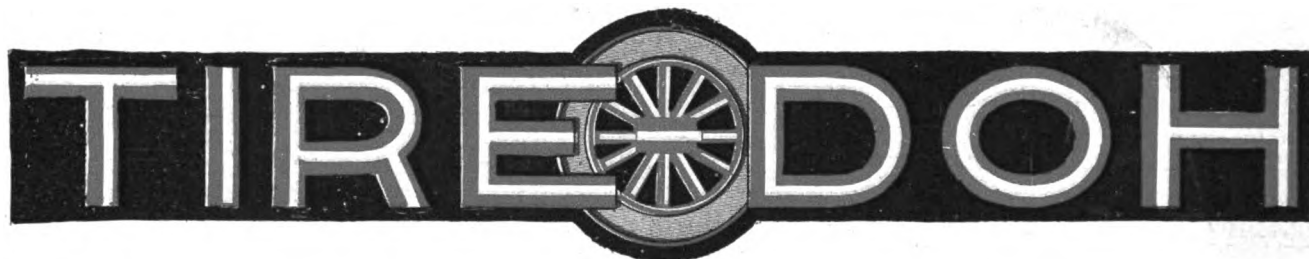
Built in All Capacities From 1 Ton Up

Denby Motor Truck Company, Detroit

DENBY
MOTOR TRUCKS

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

**There are many so-called "tire doughs"
but only one genuine original**



A Self-curing Rubber Repair

Give Your Customer What He Asks For!

WHEN your customer calls for TIRE-DOH, GIVE IT TO HIM—why "substitute"? You have TIRE-DOH, or can get it quickly. More than 10,000 Dealers have supplied the GENUINE ORIGINAL TIRE-DOH to over 750,000 motorists—it's the best tire and tube repair—best advertised—most in demand—favorably known by millions of motorists from coast to coast.

TIRE-DOH is the pioneer—the original repair which has made so "good" in its field that numerous imitators have followed in its wake. But TIRE-DOH RESULTS cannot be duplicated, because the TIRE-DOH formula is secret. Tire "putties" can imitate, but not do the real work of TIRE-DOH, which must always be used in connection with TIRE-DOH Cement.

George W. Ray

President



**The Genuine TIRE-DOH Outfit
Consists of One Can TIRE-DOH
and One Can TIRE-DOH Cement**



TIRE-DOH Sales Helps

Every possible aid is at the Dealer's command to help him cash in on the big demand for TIRE-DOH.

TIRE-DOH is advertised to car owners in leading magazines and newspapers. No automobile accessory is better known or in stronger demand.

Practical Sales Helps in the form of attractive signs, posters, circulars, window display ideas, etc., are supplied free to TIRE-DOH Dealers everywhere.

It will mean a lot to you financially to be a TIRE-DOH Dealer, for your TIRE-DOH sales will prove a real surprise.

Write today for our special Dealer's offer, prices, etc.

Atlas Auto Supply Company
680 W. Austin Avenue, Chicago, Ill.

American Garage & Auto Dealer

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

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Work for War Tax Repeal.

Both the National Automobile Dealers' Association and the National Automobile Chamber of Commerce are making strenuous efforts to obtain the repeal of the war taxes on automobiles, trucks and accessories. These efforts should have the energetic and enthusiastic support of every man engaged in the automotive industry, no matter how small his individual place in the ranks may be.

If all the employers and employees in the industry were to make it their own personal task to write to their United States Senators and Congressmen, asking them to vote for the repeal of these measures, there is little doubt but that these taxes on the industry would be decreased or done away with entirely. Tradesmen should not be content to stop with making their own protests but ought to impress upon their customers that they also should protest against the taxes because the consumer must ultimately foot the bill.

Your Trade Journal's Value.

It is only in the last few years that the efficient trade journal—business paper is the name often used now—has come to be recognized as a factor of great importance in the particular field that it represents. To those on the inside, the reason for this influence is not at all difficult to discover. The outsider may not comprehend, after a casual examination of a business paper, why it has attained the influence that it evidently has, as shown from the attitude of the field's representatives.

Investigation, however, will reveal that much of the work which a trade journal does never appears in its pages at all. A great share of it is rendered as advice and assistance of a most personal nature. This service might be said to be similar to that rendered professionally by a lawyer or a doctor to patient or client. The value of such service is not measurable in dollars and cents but it is exhibited by the loyal following in its field, which such a paper obtains.

The advice by letter and through personal conversation with the editors of trade journals has many times saved a man from most serious trouble; frequently it has pulled him out of exceedingly tight situations; and the industry has been benefited by such constructive policies. There are subscribers to the American Garage & Auto Dealer who at one time or another have appealed for aid in the solution of what to them was an exceedingly difficult problem. A visit with the American Garage & Auto Dealer's editors or a letter giving details of the difficulty soon placed another light upon the situation. And so the relations between subscribers and publication are built up—purely upon the basis of "service."

In one of the Chicago daily newspapers the assistance which may be had from the reading pages of a trade journal or business paper was recently clearly and concisely set forth.

Said the writer: "All truly alert business men read trade journals as a matter of real necessity. They feel that it is impossible for them to continue progressing unless they keep

abreast of the latest developments in their particular line of business as recorded in the journals they read."

When we read that, we thought of a recent letter which came to us requesting a discontinuance of the American Garage & Auto Dealer: "For I don't get time to open it, much less read it." Surely that man sorely needs his business paper.

"He is, indeed, a wise young man who early becomes a subscriber and a constant reader of a good journal dealing with his trade or line of business," continues the article referred to. "From it he will learn how other men in the same trade have won success.

"Almost every week he will glean from it something of direct helpfulness. One week he will be especially enlightened by an editorial article—another, he will profit most of all from a seemingly insignificant item of perhaps three or four lines, of peculiar interest to him, because it happens to touch upon a problem with which he is for the moment much concerned. Or possibly tucked away in some letter in the trade journal's correspondence columns, he may come across an idea opening up to him new vistas of thought—perhaps a new avenue of opportunity. Therefore, read at least one good journal specially intended for men in your trade."

These remarks apply to the automotive industry as well as to every other industry and trade. We find the leaders in the automotive field carefully read the trade journals not only for the purpose of keeping up to date on technical matters set forth

"They're off!"

All authorities are agreed that this country will be wonderfully busy in all lines of manufacture and trade for years to come, now that the peace treaty has been signed. So every energetic member of the automotive industry should heed the cry "They're off!"

In order that efforts will be crowned with success it must be remembered that winning the prizes of big business requires great plans and never ending effort. For months to come the United States must supply a great deal of the food, raw materials and finished products for European countries that suffered from the war, and this means immense business activity.

The dealer who finds he cannot get new passenger cars to fill orders offered to him must enlarge his field by selling trucks, tractors, trailers, farm electric plants and accessories. Owners of repair shops, service stations and garages can increase their speed in the business supremacy race by selling accessories or adding cars, trucks, tractors and trailers to lines they are now pushing. Prosperity has given the signal for the race! Let's go.



in their reading columns and new apparatus as described in the advertising sections, but they carefully scan the news items in order to interpret the trend of events which are transpiring.

These men profit from their reading, for they utilize the thoughts and ideas in their conduct of their establishments.

Prices Rising—Not Falling.

Manufacturers, economists, business men, bankers and others have repeatedly said during recent months that the man who waited for prices to come down before buying a new passenger car or motor truck would be disappointed. Automotive merchants—as well as those of practically all other business fields—have been urged to get their customers to buy whatever they needed at once in order that trade and industry might sooner return to a healthier condition.

As regards passenger cars and motor trucks especially, there has been much effort devoted to the task of trying to get those who needed vehicles to buy at once, instead of waiting for lower prices. While the war was in progress the majority of the motor truck factories were working bigger forces than ever before. So it was simple enough to figure that they would not be liable to reduce prices, in fact, in the event that production would be cut down it was certain that prices would surely be higher.

With materials for both classes of vehicles hard to obtain and then only at generally higher costs than was the case before the United States went into the war, predictions were made that selling figures would be raised rather than lowered. That this contention was sound has been proved during the last few weeks as during this period increased prices have been announced by makers of nine passenger cars and seven trucks.

Under the heading "Price Levels Rise" the Chicago Evening Post printed the following item under a Washington date line recently:

"The composite condition of all crops of the United States on July 1 was 2.4 per cent above their ten-year average condition on that date, as compared with 4.7 per cent above av-

erage on June 1, the Department of Agriculture announced today. This indicates a decline in crop prospects during the last month.

"This year's total acreage is 3 per cent below the average, it was stated, as compared with 2.4 below the average last year.

"The level of prices paid producers for the principal crops on July 1 was about 13.7 per cent higher than a year ago, 7 per cent higher than two years ago and 84 per cent higher than the average of the last 10 years.

"On June 15 the prices for meat animals were 10 per cent higher than a year ago, 25.8 per cent higher than two years ago, and 83.1 per cent higher than the average of the last nine years on June 15."

Automotive merchants should bring these facts to the attention of any of their prospective customers who have been hesitating about purchases in the hope that prices of vehicles or accessories will go down.

What if materials, labor, transportation, and sales promotion all DO cost more? That is no reason why you should fold your arms and not try to get business. Increase your own price consistently and then go after more business to balance matters up.

Teach New Owners More Than Lever Shifting and Steering.

Since the earliest days of the automobile industry the problem of how much service a dealer should give to car buyers has been a most serious problem. This whole question is treated at length on another page and it will be time well spent if every reader who ever sells a car to an inexperienced driver will take the trouble to read the article thoroughly.

There can be no argument over the assertion that car buyers will blame the vehicle for most of the troubles that are certain to develop unless they have been well instructed in handling it before the dealer leaves them to their own devices. If a dealer has not seen to it that the inexperienced buyer knows enough about the car to operate it without the necessity of frequent

calls upon the seller for adjustment or other service work the tradesman has no one to blame but himself if the owner gets the idea that the car is not as good a one as the dealer had led him to believe before he bought.

In the case of the lower priced cars especially, the dealer ought to take sufficient interest in his patrons to make sure that they are capable drivers before he leaves them to operate their cars by themselves. In most of these cases the owners are so interested over their new possessions that they do far more talking about them to their friends than the men or women who have owned cars for some time. For this reason alone dealers should take every care to thoroughly instruct all inexperienced buyers.

Reducing Labor Turnover.

One of the surest methods of reducing the labor turnover in repair shops and service stations—a source of much expense and trouble but seldom recognized as such—is to make and carry out plans to keep these establishments uniformly busy throughout the year. During the warmer months, when everyone who owns automobiles uses them there is little or no trouble keeping a repair shop or a service station busy.

It is in the cold months, when some cars are laid up and the others not operated as constantly as during the pleasant months, that there is need for the employment of some plan that will bring in the work required to keep the mechanics in repair shops and service stations busy enough so that the force of men need not be reduced because of lack of work for them.

Some excellent ways of providing the much-needed work in winter time are discussed in an article on another page. The writer declares that the summer is the proper time to make plans for keeping a repair shop or service station going at normal capacity in the winter. He explains some of the various ways in which this may be accomplished so that the owner of such an establishment will not be forced to lay off good mechanics—whose training has consumed both money and time—when chill weather drives some cars off the roads.

Personality—The Measure of a Man

What Impression Do You Make Upon People?—How to Modify or Cultivate Natural Characteristics to Develop an Attractive Personality—Fundamentals of Personality—Requirements of Personality for Dealing with Your Patrons

By Dr. J. M. Fitzgerald.

Personality is the key to individuality; it is the distinctive impression one person creates in the mind of another.

No newspaper reporter's sketch or journalist's write-up of a noted or notorious character is complete or acceptable without a word picture of the physical appearance, the traits, disposition or characteristics of the person interviewed, as they impressed the interviewer.

Mr. Jones, acknowledging an introduction to Mr. Smith by a mutual acquaintance, says: "I am pleased to meet you."

Smith, with some feeling addresses himself to the mutual acquaintance in these words: "This is the fourth time I have been introduced to Mr. Jones. The question in my mind is: Does Mr. Jones actually mean it when he says, 'I am pleased to meet you'? If so, why is it that after four introductions, he does not seem to realize the fact of our former meetings?"

"Since you have brought the matter up," observes Mr. Jones, "I do recall our previous introductions. To be frank with you, it is not complimentary to one's personality, to say the least, after having been introduced to a man four times, to have to mention the fact before you have sufficiently impressed yourself into his mind to fix the matter of acquaintance."

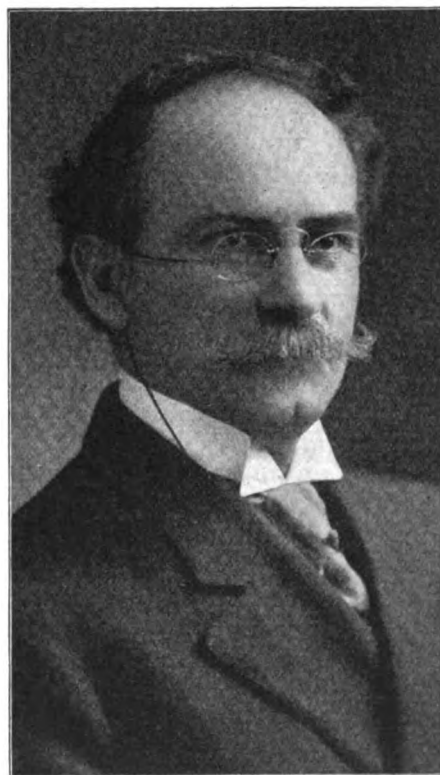
The question which affects each one of us is: What kind of a personality have we? Have we a colorless or puny personality? An attractive, impressive, magnetic or over-powering personality?

Carlyle said that Daniel Webster was the greatest libel on nature of anyone he had ever seen—that no one could possibly be as great as he appeared.

McKinley was characterized as possessing an attractive and magnetic personality, Roosevelt as possessing a dominant and directive personality.

Keen students of character state that President Wilson immediately impressed them with his great intellectuality and the vigor of his will and determination to carry out all the prerogatives of his position.

We should take an inventory of ourselves. A man attracts, is negative—or he repels. Each person must



Dr. J. M. Fitzgerald, Leading Authority on Character Analysis and Personality.

have something in his personality that distinguishes him from his neighbor—something that is individual.

The question is: What is this thing? How does it affect one's life? How does it affect others? It can be taken as a certainty that one cannot understand others until one understands one's self.

Large men command attention, providing they are physically well organized and their muscle, tone and health are all that they should be. Large men, however, are likely to depend more upon their size and bluff to suc-

ceed than they are to make use of every ounce of their gray matter.

Small men must make up for their deficiency in height and brawn by using their minds effectively. They must have more courage and self-reliance, more tactfulness and friendliness, or more intellectual resourcefulness, than the man of large physical stature.

We are affected instinctively by the size of things. Hence we move out of the way of a limousine, but we let the little Ford rattle along very close to us. Instinctively men would turn out of the way of a Jack Johnson or Jess Willard.

Most people flatter themselves that they act upon judgment and reason, but the fact is that they act generally upon impressions formed by instinctive tendencies toward things that please or displease.

Fear is a fundamental instinctive element of displeasure in the human mind as well as in the animal nature.

We are more pleased by curved lines than by straight ones. Psychologists have not given us the reason for this, but undoubtedly it is because our first happy impressions received in this world are from observing and sensing things of a spherical form. (Our first meal is thus obtained. Our mother's face and body are much more likely to be built upon curved lines than on straight ones. Our cup, plate and saucer appeal to us repeatedly. The round, warm sun appeals to us similarly.)

We can get around "Mother," but the straight-line face and head and square shoulders and angular hands of "Dad" make us walk a straight line—and we meet these straight lines oftener than it is pleasurable.

Caesar tells Anthony that he does not like the straight-line face, head and body of Cassius. "I would like to have about me fat, slick-headed men that sleep o' night," he says.

We have here the key to physical personality. If a man is built on the spherical plan, he should square his chin, bring his upper lip straight and firm against his under lip. He should cultivate those qualities that give him a straight-forward gaze and clear eye, steady hand, resolute neck and firm legs. These promise directness and strength and a fixed purpose, whereas the rounded lines of the head and body dispel fear.

Such a person, if a salesman—and we are all salesmen to a greater or lesser degree—would have a splendid combination; friendliness with the possibilities of direct and intelligent action. Nothing is more rare than a highly-developed, intelligent, earnest and vigorous purpose. The buyer or business man to whom such a person presents himself would feel that he was worth listening to. Even if the business man did not purchase anything from such a salesman, he would feel that he might secure a fact or idea worth five minutes of his time.

On the other hand, if a person is built on the square and straight-line make-up, he should curve his mouth and eyes in such a manner as to radiate hopefulness, kindness and sensitiveness as to the claims of others.

In my mind is a man who in five years has raised his earning power from \$33 a week, working as a draftsman, to \$10,000 a year as a salesman of an office machine. He has put curves into his mouth and eyes so that the remark which greets him is: "Here comes that smiling salesman" instead of "here comes that darn grouch." Those are his own words to me.

Every salesman should be conditioned as to his physical state. He should keep every muscle of his body in excellent tone that he may have all parts of the will areas of his brain coupled up and acting concordantly. This is one of his best assets.

We are affected by the pose of the head and body in general. If the head is held firmly upward and slightly backward with the chin pulled in and the hat properly placed, it gives the

command of attention, respect and something of authority. The whole carriage of the head and body is such as to affirm the feeling that a person thus constituted has a complete and perfect control over his feelings and that his knowledge is "on tap."

Personality is a cultivable thing. We all should have a flexible personality. The workman should be socially disposed so that he will instinctively and naturally suppress his egotism, that he may please his "boss" and make a sale.

The executive should have more of a fixed or directive personality. He must supply the workman with plans, ideas, information and initiative. He must aid him in fixing his belief and will in himself, his goods and the work

Here is an interesting article which applies particularly to everyone in the automotive industry. Executives, managers, in fact all business heads and employes in the automotive field, are constantly "rubbing elbows" with the public. Personality is just as essential to success in their contact with people as it is with other salesmen. Everyone is a salesman of something—cars, trucks, trailers, tractors, tires, accessories, repairs, personal services, ideas, plans, getting along with people, and, yes, even to winning a wife!

Years before the movement was started to increase efficiency by careful thought and study as to the adaption of an employee to perform a certain class or type of work, the author was engaged in studying the elements of the natural characteristics of people.

Dr. Fitzgerald is recognized as the foremost man in his particular field—that of analyzing character and advising men as to their vocational adaptations. Twenty years' successful practice enables him to speak with authority on this subject of personality.

A strong and pleasing personality is cultivable, he tells us, in presenting the fundamentals of personality building. Learn about them by reading this article—you can benefit from it.

he proposes to carry out. He must have the power of arousing enthusiasm, initiative, self-confidence and resourcefulness; otherwise the executive is misplaced.

Personality may be divided into three segments—physical, mental and spiritual.

Physical personality is determined by the age, health, height and weight of the body, and by the athletic tone of the muscles—that is, one's general appearance.

One's mental personality is determined by the training, education, responsiveness to certain demands, by

one's sense of humor and the force and character of one's thinking, or by the lack of these.

Spiritual personality can be defined by one's affection, sympathy and enthusiasm, one's interest in others and one's capacity for conscientious effort, or by the lack of these.

We are, first of all, affected profoundly by the physical personality. More people are thus affected than by the other elements of personality. The higher the development of a person's mind, the more keenly is he sensitive to and appreciative of—and the better he understands—the mental and the spiritual personality.

Undoubtedly certain situations in life require a powerful physical organization to deal with them effectively. Lincoln not only had a finer spiritual personality but a more powerful and impressive physical personality than did Douglas, the little giant. His intellectual personality was natively superior to the same elements of Douglas' nature and directed by his great love, sympathy and conscience, he became the supreme man of his age.

While a member of Congress, Lincoln, after having heard Alexander Stevens make a speech, wrote his friend, Hurd: "A little, slim, pale-faced, consumptive man has just concluded the very best speech of and hour's length I ever heard. My old withered dry eyes are full of tears yet." Here the mental and spiritual personality of Stevens completely transcended the physical limitations.

To be a successful salesman a person should possess these fundamental qualities in the relation given, though some lines of business might require less of one and more of another: Friendship, energy, acquisitiveness, pride, sensitiveness, self-confidence, conscientiousness, firmness, hope, perception, language, comparison and human nature.

He would, therefore, be friendly, energetic, a student of business, ambitious to excel and to gain the good will of other men; self-confident that he may carry his goods, or his proposition, and his knowledge to men who

stand high in their business or work; conscientious that he will not lie about what he has to sell, nor about his firm once he leaves them.

Although he may be turned down nine times he would come back with a smile, hopeful and succeed the tenth. He would have firmness of purpose that he does not give up or work in a half-hearted state of mind; perception, that he may see clearly the country through which he travels and know from the appearance of the people living in it what sort of towns

must grow out of such developed communities.

When he gets off at the depot, he would be able to picture something of the business buildings of that town, and as he passes those buildings, he would be able to determine something of the character of the business that is carried on within them.

On entering a store or place of business he would know from the counters, show cases and goods, the condition of the store, what kind of a man is at the head of the concern, etc.

He would have a fact-observing and analyzing mind. He would understand the type of man that he has to deal with and be able to converse with him in the language that that man is accustomed to use in expressing his thoughts and views.

In short, it is a self-evident psychological law that the strong turn to the strong for companions and associates and those to whom they wish to delegate a responsibility. They never turn to the weak except out of sympathy, or pity, or to make use of them.

If I Were an Automobile Dealer

Keen Observer Tells How Local Representative Who Cold-Shouldered High School Boy Lost Sales of Three Touring Cars, a Runabout and Delivery Fleet to Competitor—Cites Somewhat Similar Case of Clothing Merchants

By Lester G. Herbert

Sometimes those who are on the outside looking in see some things which those who are *inside* looking out do not even think of.

Again and again I have found myself saying, "If I were an automobile dealer, 'I would do thus and so,'" and I am confident that some of these ideas would stand the test of practical, profitable use.

Most dealers today cater to the mature, adult buyer. They reason to themselves after this manner — "What's the use of my bothering with anybody who is not prepared to come across with the cash! It costs too much money to do business in any other way."

Now let me digress just a minute and tell you the story of two business men who are not in the automobile line at all, but rather in the clothing line, and then I can make my point clearer, I am sure.

The firm, which we will call Wilkins & Wilkins, was an old established one having been in the very best location in the business district of a prosperous, middle-sized city for more than half a century. The name of Wilkins & Wilkins stood for quality and conservatism in every way. They catered to mature buyers, arguing that a Youth's Department was a nuisance and young men's clothing

a snare and a delusion because they demanded natty, classy novelties. It was their own policy to stock staples and to stick to them.

Across the way from Wilkins & Wilkins, a young man went into business in the same line. He did not have money enough to rent a ground floor store, so he took a couple of rooms upstairs on the front. These he fixed up attractively and stocked with clothing which would appeal directly to the young men of the community.

His argument was, "The smartest dressers and the ones who buy most frequently, are the young fellows just beginning to earn for themselves, or who have got enough on their feet to begin to indulge their own tastes. If I can win their trade and hold it from eighteen to twenty-five, I will stand a mighty good show of clothing them as long as I am in business by gradually stocking up with more conservative lines also."

Today the firm of Wilkins & Wilkins is a memory, the stock having been closed out at auction a couple of years ago because of lack of vision. The upstairs establishment of our friend Greenfield is flourishing like a veritable green bay tree and he is easily the leader in his line in dressing the young men of the city. He

is also working up a nice trade with the older people as well.

I could multiply this example by a dozen different lines if space and time permitted, but one illustration is as good as a dozen.

I may as well confess that I have a family of boys, and boys take to motor-driven vehicles as naturally as ducks do to water. Not only do I have an opportunity to observe my own boys, but we seem to be the center of a sort of boy community, and I am continually impressed, surprised, and sometimes astounded by the keenness of even the small lads for practical mechanics.

What would you think of a child of four years of age who could distinguish without effort, the tones of a number of different automobile motors, yet I know such a case. No one has made any effort to teach him, but he will look up from his play and say, "Here comes Uncle Ben. I hear his tar," and it will prove to be Uncle Ben, too.

As the lads grow older, their inquiring nature and their spirit of adventure, together with their love of mastery, make them eager possessors of anything which will go. Today one of the most successful automobile dealers in the country declares that his present splendid business was be-

gun when he began to tinker with an old clock work, and later when he was able by much jacking and trading to become the owner of an old motor. The very fact that he had to improvise and make his own repairs and puzzle out his own problems, trained him to be keenly analytical and to surmount difficulties.

When one of my nine year old lads came with shining eyes and asked for a small, toy motor, I said casually, "Earn the money and you can have it." He came back in less than an hour with the motor. He had picked some rare roses from a bush which had been given to him, and sold them to a florist.

I have followed him, his brothers, and a half a hundred companions from the days of the toy motor and velocipede stage, through the bicycle age, the motorcycle craze, the old second-hand car stripped down for a racer, on up to the proud possession of a runabout and the eventful ownership of a real high-power car.

Believe me, if I were an automobile dealer, I would make myself solid by *some means* with the boys as soon as they entered their early teens, and certainly by the time they had reached the middle teens.

Even as I write this, two of my own boys are in respective garages, one fixing up his own car, and the other having some adjustments made on the family car. Each boy (one nineteen and one sixteen) has his pet place to go and no one could undermine the loyalty of either, for haven't the dealers in each case been friends of those lads for the last three or four years? Each one feels that he has a special "stand in," not in the way of getting work done for nothing by any means, but rather in the way of interest and kindly, sincere advice when it is needed upon automobile problems as they may arise.

To show how easily a young fellow who is somewhat sensitive, because he is not yet being accepted as a full-fledged man while he is conscious that he has left childish things behind, may be offended, I will tell you an actual experience.

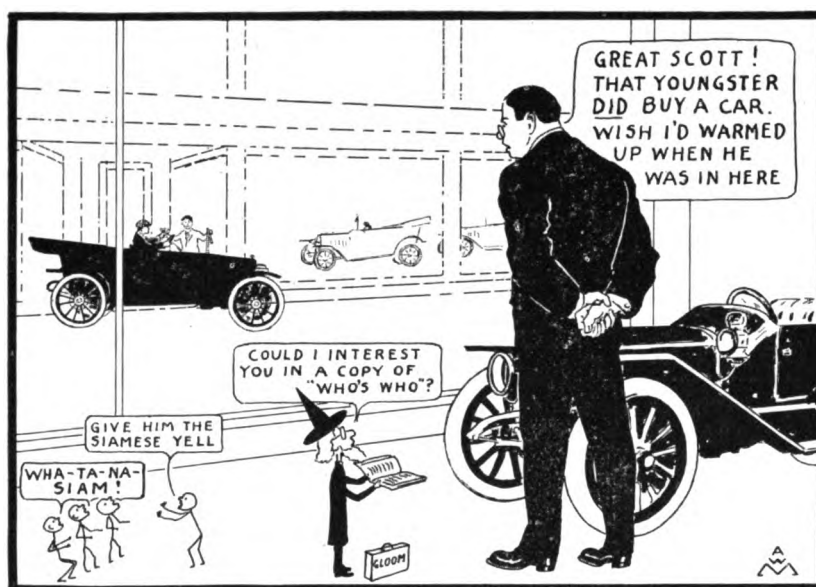
One young fellow about seventeen, went into a showroom and began pricing cars. Now the dealer knew that he was in high school and lucky if he had fifty cents a week spending money, so he was rather short and none too cordial. The dealer also knew that the father was a man of presumably modest means, with a fair salary, but at the present time not a good automobile prospect. Several times the boy went in and each time received indifferent treatment. He

it work out that when the young folks of the family set out to have an automobile, that they got it. In fact, I have heard him say that the very best automobile fans in his territory were the young fellows from fifteen to twenty-five. Our young friend was cordially received, reasonable attention given him, and what he appreciated more than anything else, he was taken seriously as man to man. That dealer sold a high-priced car and a big bill of equipment to the father in a short time.

About two weeks later the lad came in again, his eyes shining and said, "Dad thinks that his new car is too much of a luxury for a boy like me to drive whenever I please, so he says

I can get a small car of my own! Would you advise a runabout or a coupe?"

Nor is that the end of the story, for the father in the case brought two of his brothers to the same dealer, who each bought cars of the same make as his. One of them found that through this dealer he could get most advantageous terms on a line of new automobile delivery vehicles he was installing in a new branch of his business. It paid to



Courtesy to Young Men Often Helps to Sell Cars to Their Families.

was not discourteously used but simply given the cold shoulder.

Now it so happened that the family was in realty one of abundant means but from habit and preference, they lived modestly. The young fellow was anxious that his father should buy a car and was promoting such a project in his own home morning, noon, and night. He wanted to get posted so as to have something in the way of facts and figures to tell his Dad, but as he received no encouragement in the showroom selling the cars which had at first appealed to him, he went to another salesroom.

Here the dealer was a far-sighted man. Again and again he had seen

please that boy, just as it paid Greenfield to cater to the clothing trade of the young fellows of his public.

No one wants a crowd of boys about a showroom making a rough house, nor do they want it a hang-out place for those with a good deal of time on their hands. But it is mighty certain that it is good business to be friends with the young men. They have a way of becoming live-wire business people in a remarkably short time, and few of them will overlook what they consider deliberate slights.

Let us not forget that the American young fellow today is surprisingly self-reliant, mentally alert, and won-

derfully ambitious. And one of the ambitions of ninety-nine out of every hundred is to possess a worthy, motor-driven vehicle.

Some dealers will say, "I can sell all the cars now for which I can guarantee delivery. Why should I go out of my way to promote trade when there is small chance I can take care of it?"

That's just exactly the way Wilkins & Wilkins talked. They forgot that modern business life is full of quirks and turns and that changes are constantly taking place.

Do you know, Friend Automobile Dealer, now that the war is over we are going to face an entirely different

set of conditions and you and I and every other line of business, must adjust ourselves to the new regime or be left out in the cold? Do you realize that two million or more of the flower of our American young manhood has been disciplined and trained and taught to overcome obstacles as never before?

A large percentage of them have come back into business life and competition will be keener because of the push they will put into business and the new standards of efficiency they have been trained to reach. Then besides that, the youth of the country who were too young for the draft or enlistment, have had special training of their own, and they will march for-

ward with their heads up and eager to imitate those who have gone "Over the top."

An undoubted era of prosperity will follow the reconstruction period and the sales of automobiles will show a much larger percentage of deals with the younger men who have returned to us and who are reaching their maturity now, than to the older men.

Oh, if I were an automobile dealer, I would think it all out on these lines and map out a campaign of NEIGHBORLINESS with those who *influence the home decisions* and those who will soon make decisions for themselves!

Army Motor Corps to Cross Country

Khaki Truck Convoy of Two Companies Begins Journey from Washington to San Francisco to Gather Military Data on Road Conditions, Show Need of Federal Support for Highway Construction and Win Recruits

By A. F. Bement.

Vice-President and Secretary, Lincoln Highway Association.

Secretary of War Baker and the General Staff authorized the first transcontinental army motor convoy trip that started from Washington early this month. The Lincoln Highway was designated as the route to be followed. This recognition of its connected improvement and wise location establishes it as the first Atlantic to Pacific military highway and pre-sages its ultimate selection as the backbone route of any Federal highway system.

The cross country trip of this first motor transport convoy will in its way be as historic an event as the first trans-Atlantic flight. Its significance in illustrating the ultimate possibility of another revolutionizing step in the development of transportation will be as great.

The Lincoln Highway Association has for many months been working with the War Department and the officers of the Motor Transport Corps. First in assisting in the selection and logging of the various routes from interior manufacturing centers to the Atlantic coast during the war. Later in providing the necessary data

for the first transcontinental trip, the final authorization of which assures the greatest public demonstration of the practicability of long distance freight transportation and the necessity of linking up interstate routes of travel, which has ever been offered to the country.

Two complete truck companies of war strength, consisting of a total of 42 army trucks, including all of the standard makes used by the Government during the war, as well as a number of the B type design, accompanied by five staff, observation and reconnaissance passenger cars, complement of motor cycles, ambulances, tank trucks, mobile field kitchens, mobile repair shops and signal corps searchlight trucks, and a personnel of 209 army officers and men were to be officially started from the Capitol at Washington, July 7. The convoy will proceed by way of Frederick to Gettysburg, Pa., from which point the Lincoln Highway will be followed to San Francisco.

Vice-president and Field Secretary H. C. Ostermann of the Lincoln Highway Association has been appointed

by General Drake of the Motor Transport Corps as official pilot for the trip. The Lincoln Highway Association has been delegated to handle all publicity for the army and to co-operate in every way possible to provide the best of road conditions.

Brigadier General Charles B. Drake, Chief of the Motor Transport Corps, announces the purposes of the trip to be fourfold:

1—To provide an extended service and performance test of the various standardized types of army motor equipment.

2—To collect detailed data for use in connection with the technical training of the commissioned and enlisted personnel of the Motor Transport Corps and provide an opportunity for extensive studies in terrain observation and needed highway data by the Field Artillery, the Engineering Corps and the Motor Transport Corps.

3—To demonstrate the practicability of long distance motor commercial transportation and the consequent necessity for the expenditure of governmental appropriations to provide necessary highways and to assist in the

movement for the continuous improvement of, not only the Lincoln Highway, but all through connecting routes in the Union.

4—And last, but not least, to provide an opportunity for procuring recruits for the Motor Transport Service.

In announcing the trip General Drake, who will be in personal command of the convoy from Salt Lake City west, said:

"We hope in conducting this first transcontinental run of an Army Transport Convoy, to give an exhibition to the general public of the vast development of the motorized branch of the army and of the motor vehicle for military purposes, which development is conceded to be one of the principal factors contributing to the winning of the war.

"It is also to be hoped that the trip, in addition to providing experience and data required by the War Department, will serve the purpose of indicating the need for the immediate development of transcontinental highways and of through interstate connecting roads as military and economic assets. This trip over the Lincoln

Highway is in a measure the War Department's contribution towards the good roads cause, a movement in which the army is vitally interested."

Letters have been addressed by the War Department to the Governors and State Highway Departments of the ten states traversed, requesting that improvements now in progress or in contemplation for the Lincoln Highway this season be rushed.

No record will be attempted on the trip and every opportunity will be provided for road meetings in the main

centers on the route, for talks by recruiting officers on the benefits of the Motor Transport Service and by officers of the Engineering Corps on highway improvement. Demonstrations and civic holidays will be planned all along the route, as well as official receptions by Governors of the various States, and holding of Motor Transport Days, parades, local celebrations, etc.

It is felt by those close to the situation in Washington that the War Department's authorization of the transcontinental convoy is one of the best recommendations which could possibly have been presented to Congress by the War Department for the prompt passage of the Townsend Highway

The report of the Motor Transport Corps to the General Staff in connection with the trip states: "The widest possible publicity should be given to the transcontinental motor convoy. This is essential in order that the purposes of the project should be fully realized".

The Lincoln Highway Association asks the co-operation of all the highway organizations and good roads associations in the country in bringing the purposes of this trip and its results fully to the attention of its membership and to the American public.

The fullest possible statistical and historical data will be kept by officers detailed for that purpose during the course of the run. Daily reports will

go to the War Department covering not only the individual performance of every vehicle constituting the convoy, but also engineering reports relative to the condition of the Lincoln Highway, nature and strength of bridges, location of grades, work in progress, etc.

Extensive studies in terrain will be carried on by officers of the Engineering Corps and the Air Service, and much data of the greatest value to

vocational schools established by the Motor Transport Corps in the training of the commissioned and enlisted personnel will be obtained. Special reports will be sent daily to the headquarters of the Lincoln Highway Association.

The convoy will be under the command of Colonel A. Owen Seaman of the General Staff from Washington to Salt Lake City, Utah, at which point General Drake will take command. It is planned to reach San Francisco about September 1.

Equipment which will constitute the Motor Transport Corps cross country convoy is as follows:

COMPANY A

Passenger Cars

- 1 Light, open, Dodge
- 1 Staff Observation, White

Ambulances

- 1 Heavy GMC

Motorcycles

- 1 Solo, Harley-Davidson
- 2 Side Cars, Harley-Davidson

Trucks

- 3 Mack
- 3 Riker
- 3 FWD
- 3 Packard
- 1 White, new drive, 3 ton
- 3 Standardized B
- 2 Light Delivery, Dodge

Miscellaneous

- 1 Machine Shop Truck
- 1 Kitchen Trailer
- 1 Tank Truck

COMPANY B

Passenger Cars

- 1 Light, open, Dodge
- 1 Heavy, open, Cadillac
- 1 Reconnaissance, White

Ambulances

- 1 Heavy GMC

Motorcycles

- 1 Solo, Indian
- 2 Side Cars, Indian

Trucks

- 6 1½-ton, White
- 2 1½-ton GMC
- 7 3-ton Standard B
- 2 Light Delivery, Dodge

Miscellaneous

- 1 Tank Truck
- 1 Kitchen Trailer
- 1 Water Tank Truck

ENGINEER UNIT

- 1 Engineer Shop Truck
- 1 Office Work Truck
- 1 Searchlight Truck

Bill.

This bill, introduced by Senator Charles E. Townsend of Michigan, provides for the immediate establishment of a Federal Highway Commission of three experts to be appointed by the President and appropriates \$425,000,000 for the construction of an adequate main system of Federal highways to be laid out by the Commission and constructed by the Government and to constitute at least 2% of the existing highway mileage of the United States.

Dealers' Service Where Needed Most

Writer Explains How Car Agents Who Permit Inexperienced Drivers to Take Delivery of Their Vehicles Without Thorough Knowledge of Care and Operation Jeopardize Their Chances of Future Trade

By George S. Brown

Selling a car and satisfying the purchaser in every way is a good thing for the dealer; then if that purchaser can make the car show up in such a manner as to interest other buyers, a much greater benefit is wrought for the dealer. If the car instead of being handled successfully, however, is so operated as to adversely impress prospective purchasers—the result then is somewhat different.

We read, hear, and see much concerning service that dealers give to car owners. Now, service is a mighty good thing, but you never knew of a car owner complaining of not getting service if he had no need of it. It is also true that those who need the most service are the ones who were not taught that vital requirement: operating cars correctly. We hear very little about this although dealers know that skillful drivers require much less service than the unskilled.

There is nothing that will give a car a "black eye" any quicker than to put it into the hands of a novice who has barely sufficient knowledge to shift the gears. And if a car is just being introduced in new territory, there is no worse advertisement than to have the first ones sold fall into the clutches of beginners who will operate them with the customary incomplete instructions given by the average present day dealer.

How frequently we hear this: "Oh, well, any old thing would run well for that fellow; he knows just how to handle cars." We not only hear it, but we know it to be true. We ought to know that the reverse of it is also true. Most of us do. We know that a high priced car of excellent reputation will not make anywhere near as good a showing in the hands of a bungling amateur, as a low priced car—and perhaps inferior in every way—will when operated by a skillful driver.

How much time is given to the purchaser of a car in instructing him in its correct driving and care? Very little. No more than is absolutely necessary to get him on the road. How much time is later given this same person as service? A whole lot. And when it comes down to facts, the most service is given to the drivers who know the least about their cars.

They *think* that some part of the car is making a "queer noise," and knowing well that they know but little, they rush for help. Even if there is nothing at all wrong, it takes the dealer's time to look after these matters, and it is no boost for a car to have its purchasers hanging around all the time for service. What is the effect of this on prospective purchasers? It is very bad; regardless of whether the calls for service are justified or not.

Even though drivers and the dealers themselves complain to the builders about broken gears, drive shafts, universal joints, or sheared keys, or ruined bearings, etc., claiming flaws in the material, how many of these claims are just? Not one out of a hundred. Negligence, improper care, abuse and ignorance on the driver's part, are the greatest causes of breakdowns blamed on "flaws." The "flaws" are nearly every time in the man who handled the car.

To repair breaks such as mentioned above, takes good material and much labor. The operator of the car doesn't know enough about driving to realize the punishment he inflicts on his machine, so he feels that the blame is with the car. The dealer cannot afford to antagonize the owner, so he has to stand the expense and by doing this, he shoulders the blame. In this way the motorist is led to believe that the trouble is really with the car and not with himself.

When the car owner gets ready to

purchase another car—who gets the business? The dealer who first sold him? The one who has given him service ever since? Not so you could notice it! The car buyer knows (?) that his old car is full of weaknesses, so he places his custom with a different dealer.

Now, here's where the joke—if you can call it one—comes in. The new car of a different make works out beautifully in nine cases out of ten, and its owner is "tickled pink." Why is this? It is because in his gear-breaking and bearing-abusing career with his old car, the driver learned by experience what the first dealer never bothered his head to teach him: He has learned to correctly, or very nearly so, drive and care for a car.

He gives the square deal to the new vehicle that he didn't know he wasn't giving to his old one. The result is that the new automobile gives no trouble worth mentioning, and when a prospective car buyer asks his opinion or advice about a purchase, which car gets a "boost"? If neither car is "boosted," which one is "knocked"?

Dealers, does it pay to turn a new car buyer loose on the public to threaten lives, to ruin the reputation of your cars, and discredit yourselves? Emphatically, NO! Before you let one of your cars out of your grip, see to it that the purchaser *knows* the car and how to handle it. If the buyer is entitled to so many hours or dollars' worth of service, then, by all means, tack on all of it you can at the beginning.

Start him right and he will need but little of the questionable service he would otherwise demand. It will be a whole lot better for him, whether he knows it or not; and when he has nothing to offer his friends but good words for your car, it will be a whole lot better for you, too. And you will most certainly know it.

Workers' Danger in Practical Jokes

Rights of Employes to Obtain Damages from Employers After Being Injured at Place of Employment Explained by Writer Who Tells Instances in Which Employers Were Not Legally Under Obligation to Compensate Injured Men

By Chesla C. Sherlock.

Two garage employes were using a high-powered vacuum cleaning apparatus to clean upholstered sedans. At the noon hour, one of them lay down and took a nap after finishing his lunch.

At one o'clock, when it was time to resume work, the other thought that he would awaken the other with a little "practical joke." He applied the nozzle to the sleeper's abdomen and turned on the current.

The vacuum drew out the intestines of the sleeping man so that the great intestine was pulled out to the length of fourteen feet, as the record in the case shows, causing the victim to die in great agony.

In another case, a workman of the bully type had been "picking on" a rather bashful fellow who had been in the employ of the owner only a few days.

On the time indicated, he made a "pass" at the little fellow as if to slug him on the head. He later testified that he merely intended to knock off his hat.

At any rate, the victim took the movement seriously, ducked, lost his balance and fell, striking his head on the slippery concrete floor, sustaining a fractured skull and died a few hours later.

In another case, the repair shop was on the second story of the establishment. A workman was sitting on the floor at the head of the steps reading a newspaper. Another workman

started to descend the stairs, carrying a heavy load.

The record shows that the latter was extremely "ticklish" and that his fellow workmen had been having a great deal of sport at his expense by tickling him on any and all occasions.

At the time in question, the workman reading the paper folded it up and tickled the victim in the ribs as

he dropped a hammer on one with the result that an explosion occurred, tearing off the thumb and first finger, and hurling bits of brass into the workman's stomach.

A "loaded" cigar exploded in the face of another employe and took with it his eyesight. Another workman ignited a small pool of oil on the floor of the garage, thinking to frighten another workman.

But the result was a series of explosions and a serious fire, which not only killed the victim of the joke but caused immense damage.

I might give dozens of other examples of the results of "practical jokes" contained in the reports of cases coming before the courts, but those given will serve to show that practical jokes are exceedingly disastrous in every shop and factory.

Wherever men are employed you will find such things taking place and they seldom end until someone in that particular shop suffers an injury sufficient to

open the eyes of the "jokers."

Workmen have an erroneous impression as to the rights which they have in such circumstances under the law. And if workmen understood thoroughly just what the law is in such cases, they would certainly stop this foolishness, for it would be to their own interest to do so.

Under the common law, in the cases mentioned above, not a single workman or his dependents could recover



Regrets for Fatal "Practical Jokes" Do Not Help the Relatives of a Victim.

he started to descend the steps. As a result, he jumped, lost his balance and fell the length of the stairs, the load falling on top of him and crushing him to death.

In another case, a workman got hold of some dynamite caps. As a practical joke, he placed one of them in the tool drawer of a bench-worker and also placed a few of them about the bench. While the latter was at work, not knowing what they were,

a single cent of damages from the employer, because these men were injured not through the negligence of the employer, but through the negligence of a fellow servant. The common law denied damages in such cases. So the "practical joke" victim had to carry the burden alone.

Most garage and repair shop owners are operating under the workmen's compensation act at the present time, as it is in force in all but ten of the States of the Union.

Let us examine the rights of workmen so injured under the workmen's compensation acts. These acts secure compensation to workmen who are injured by accident "arising out of

and in the course of the employment" regardless of just how the accident arose.

This naturally leads many workmen to suppose that they will be compensated for injuries received, no matter what the moving cause was. This is, in the main, true, but it has its limitations and often operates to deprive an innocent man of any relief.

If the workman injured is himself indulging in practical jokes, or if the practical joke is so aggravated as to lead an innocent man "outside the scope of his employment," then no compensation can be recovered from the owner for the injuries received.

Being "outside the scope of employ-

ment" has a technical meaning and is often very narrow. A workman may leave his work and take only a step away and be "outside his employment," as in a case where a workman saw a roach running across the floor, chased it to kill it, stepped on it, slipped and fell to his death. This was held to be outside the scope of his employment and no compensation was payable.

This simply means that garage and repair shop employees, to protect their own interest or that of their dependents, must revise their ideas as to what the law will do for them, if they are injured, or injure their fellows, as the result of a "practical joke."

Plan Now for Winter Repair Work

During the Pleasant Summer Months, When Majority of Car Owners Do Most Driving, Is Best Time to Gather Information About the Vehicles That Will Help Shop Operator to Get Business in Slack Season Later

By Robert Falconer.

In spite of the fact that the automobile is a year round vehicle and most owners do use their cars practically every month in the year, it is in the pleasant summer months that the majority of people do the most driving. Naturally it is during the period when the most driving is being done that the garage and the repair shop are busiest.

Often the garages are so busy that the owners do not look forward and plan for the dull winter period which is ahead. Since at the best the automobile business is a seasonable one it is necessary to plan a long way in advance to keep busy during the off seasons.

The time to plan for winter business is now. Information can easily be obtained in the summer which will prove invaluable in securing business in winter. Cars that have only minor repairs made on them now will have to be overhauled later on. If a record is kept of each individual car it will not be hard to get the overhauling business at a time when it will be most advantageous, both for the garage and for the owner, to have it done. If this information is not recorded at this time it will have been forgotten by

the time that its use would prove of value.

It will not take very long to record upon each job card the mileage reading of the speedometer, the general condition of the car, the condition of the tires and any features which point to the need of having the car overhauled next winter.

If these job cards or at least a copy of this special information is filed away under the name of the owner and all future job cards or a copy of this special information is filed away in the same manner it will be found when the dull season sets in that there is at hand an accurate and complete history of the car of each customer. The cards will show the mileage that has been run, the condition of the car and a great deal of other information that will make it comparatively easy to solicit over the telephone the job of overhauling that car if it is found that the vehicle should be overhauled.

With all this information filed away all that is necessary when the work in the repair shop becomes low is to go over the file, select the names of the owners of a number of cars which should be overhauled, call one after another on the telephone and explain

the need of overhauling and the advantage of having it done when the shop is not rushed. It may even be possible to show that it can be done cheaper at that time. In any case it can be done better and the owner can probably spare his car better at that time than he could at another season of the year.

The ending of the war has brought with it a renewal of the used car problem. This problem now promises to be even more serious than it was just previous to the war. Everyone is expecting a great drop in prices. Prices may actually drop. That they will, however, is not at all certain. Nevertheless, it is well to be prepared for such a contingency.

These conditions tend to make the owner demand an extremely high price for the old car if he is to trade it in for a new one and it tends to make it harder to dispose of the used car at the price it should be sold for. A careful record of the condition of all the cars repaired in the shop will indicate as no casual inspection could ascertain the real value of each car.

These records can be used as a basis upon which to make appraisals. Just at the approach of or when the

dull season is in full swing is a good time to suggest that these cars be traded in. At that time more than any other a good allowance can safely be made for the car.

When the shop is not busy, it can be set to work rebuilding cars and a rebuilt car, one that has been changed more or less radically in appearance, will sell better, especially in a small place, than will one that has merely been overhauled. During the busy season it is out of the question to rebuild cars. There will be more money in making repairs.

When the dull season arrives, however, it is worth something to keep the shop busy, to keep the working force intact. At this time it is a real advantage to rebuild and overhaul cars. The surest and the best way of getting such business when it is wanted is to collect up information and to make plans now while the busy season is still on.

During the summer of 1919 and for many summers to come there is going to be far more automobile touring in America than there has ever been before. The conditions existing in Europe are going to force many people who otherwise would spend their summers abroad to spend them in automobile travel at home. This means that summer seasons will probably become busier and busier in the garage and repair shop.

There will be transient trade and there will be regular customers who will want their cars gone over and tuned up in preparation for a vacation tour. This increase of summer business means that unless special efforts are made, unless careful plans are thought out, there is going to be a greater difference than ever before between the amount of work that is done in summer and the amount that is done in winter.

In order to run the shop efficiently, economically and profitably in summer it is essential that the working force be held together in the winter time. It is not sufficiently easy to secure first class workmen on automobiles, train them in the shop to render satisfactory service to the customer and get the whole organization running smoothly to make it wise to let

the good men go and disrupt the whole organization in winter.

There is a considerable dissatisfaction among many owners in regard to the class of work that is done in the average garage. Much of this dissatisfaction can be traced to the practice in many garages of putting to work a comparatively large force of men and boys in summer and cutting down this force in the fall to the barest minimum. This results in getting together a new group of workers each summer. By the time they have become accustomed to the concern and to working with each other they are dismissed.

It is this custom also which has made it so hard to obtain in a garage the type of men needed for the most satisfactory service and the most profitable business. It will pay very much better to begin to plan now to keep all the good men busy all next winter than it will to let them go as soon as business begins to fall off.

The more permanent the employment in any repair shop or garage, other things being equal, the better the grade of men that can be hired for a given wage and the more efficient the organization may be made.

This, however, is not all. To make a profit it is just as necessary to keep down the labor turnover as it is to keep up the turnover of capital invested in the goods to be sold. The Ford Motor Company has found that the decrease in labor turnover that has resulted from its high wages and welfare work has gone a long way towards offsetting the cost of these two items.

It costs a certain amount to hire a man, and it costs something to train him, no matter how experienced he may be, for there are no two concerns that are run on exactly the same lines. It often happens that many men must be hired before one satisfactory mechanic is found. In the course of finding the right man, time, material and customer good will are probably lost.

It is these things that makes it so vitally important to keep the garage and repair shop busy all winter long and to prepare at once for winter business. In some respects the garage

business is not unlike the mining business.

There are two methods pursued by miners. One is to prospect until ore-bearing ground is found and then to concentrate all energies upon getting out the ore until the ground is exhausted and then start in prospecting again. Some of the men who pursue this course are lucky enough to continue to make money. Most of them are affluent for a few years and broke the rest of the time.

The other method is to continue prospecting while the rich ground is being worked. Under this method miners continue to make money, they keep on increasing their wealth and rarely ever go broke. This is the business-like way of going about the business.

The prosperous garage and repair men are those who prepare a long time in advance for the dull season.

In the winter time when business is slack, overhauling, rebuilding, painting, all manner of long jobs, can be done with profit and at the same time be done at a lower price than they could be done during the very busy summer season. A little planning, a little effort spent in gathering information now followed in the dull season by a little real salesmanship will result in filling up the shop, keeping the working force busy and maintaining the profits the year round. This cannot be done, however, unless some real thought, some real planning is devoted to the problem now.

Automotive Equipment Show for Chicago Next November.

Plans for holding a show at the Medinah Temple, Chicago, from Monday, November 3, to Saturday, November 8, 1919, were adopted at a recent convention of the Automotive Equipment Association held at Hot Springs, Va.

Commissioner Wm. M. Webster has sent out a notice to the effect that blank contracts, diagrams and other data have been mailed to members of the organization. Applications for space are confined to manufacturer members only. Announcement is made that all jobbers, members or non-members, will be welcomed at the exhibition.

Use of Sales Ticket in Accounting

System Expert Explains Methods of Recording the Bulk of All Daily Transactions on Duplicate or Triplicate Slips Which Later Provide Means of Starting Permanent Accounting History of Any Business

By J. Newton Boddy

Manager System Department, Tanner, Gilman & Ellis, Chicago.

In this article we will take up the matter of a daily record of business transactions. If a complete memorandum is made and saved of every transaction when it happens, a set of books or history and analysis of your business can be built at any time from these memoranda, even though they were made on wrapping paper.

We wish to have our records as uniform as possible, however, so we resort to the use of sales slips or sales books. As we are in business to sell merchandise or services the majority of our transactions will be sales. We use these sales slips, however, to record all other transactions where we have no other original memoranda.

This means that practically all transactions, excepting those with the people from whom we buy, will be recorded on sales slips. Sales, charge or cash; receipts on account, and "paid outs" in cash, will all be shown on sales slips. Check stubs or duplicate checks can be used as memoranda for payments by check. Invoices, debit and credit memoranda, will be your memoranda of transactions with the vendors from whom you get goods.

It often happens that you wish to make a record of a return of merchandise to the seller, or to charge him with an allowance or rebate. In such case, make a memorandum on the sales slip. The big idea is:

"Have an original memorandum of every transaction."

Next have these memoranda numbered or recorded so that you may guard against their loss.

There are three forms of sales slips most commonly in use, i. e.,

- (1) Those projected from a sales register, such as made by the American Sales Book Company, Autographic Reg-

ister Company or Egry Register Company;

- (2) Those put up in the book form—two, three or more slips to the sheet, original and duplicate perforated, triplicate not perforated, so as to form a journal;

- (3) The regular duplicate or triplicate sales book are manufactured by a host of concerns. (I personally prefer this form, though I have at times used the other forms.)

Duplicating sales books will do, but triplicating books will do much better. The sales slip should be large enough



Some Sample Road Conditions Encountered by J. Newton Boddy while Riding in a Koehler Truck from Coffeyville to Independence, Kansas, April 23, 1916, with Frank H. Frost.

to permit of sufficient descriptions, and in the case of the sales book, it should not be so large that it will be inconvenient to carry. I have found a ticket, 4¼x7 in. to meet requirements in the majority of cases.

The form of ticket herewith explained is one devised by the writer early in his automotive accounting experience. Since then I have seen no necessity to make any material change in it to meet the requirements of the average automobile dealer. This memorandum with your advertisement printed on the reverse side, is a

constant advertisement of your business to all that receive a copy of it. It is important, as you will learn later, that this ticket have three columns:

- (1) Price,
- (2) Amount,
- (3) Cost.

The cost column is to be filled in on the copies retained by the office. Again we say it is important that these tickets be numbered that we may be sure we have them all recorded in our daily business record.

One big advantage of making records when transactions take place is the check it gives us on our stock. No stock should leave the stockroom, and no job leave the repairshop, without a proper cash slip showing for it or a properly "O. K.'d" charge ticket being produced.

This constant and continuous check on your stockroom and repair department will help materially to stop the biggest leak in most automotive businesses. Charge tickets should be initialed by the person receiving the merchandise or taking the car out of the shop. This will save many disputes over statements at the end of the month.

We are pleased to state we received several very gratifying letters in response to our first article. We quote from one as follows:

"We have read your article in the American Garage and Auto Dealer, and can assure you that we have been looking forward to an opportunity like this for a long time.

"As a matter of fact we have a good set of books, which are audited every month, by an expert accountant, for the benefit of our New York partner, but somehow or other, there is not enough information available. By that I mean that we can get what we want, but it will be necessary to work same out during the month.

"What we want is a system, whereby any information can be given, any time it is wanted. It seems that we have had four bookkeepers in about one year, they were all good at that, but every other one would install something new, and therefore that necessitated a new acquaintance with that certain phase of the books.

"We have a large repair and vulcanizing shop in which we also do retreading of tires. This department of our business does about 35 per cent of entire business for the month, and is a very important factor, you will agree with me. We cannot tell the exact cost of our tires that we put out, and do not distribute our overhead expense in a proper manner. This is one thing that aggravates everybody, whenever we try to find the cost of a certain retreaded tire.

"We also cannot tell the real amount of profit derived every month. Our auditor, after the trial balance and undivided profit report is made out, just audits our books and has not as yet made any comment on our large, undivided profit, which, as a matter of fact, is just absolutely fabulous. Our bank balance does not look anywhere near the profit that is shown on our regular monthly statements.

"We would greatly appreciate it if you would refer us to an accounting system which will remedy all these above mentioned errors on our books.

"We can assure you that any aid you may give us in our book-keeping and accounting system, would be greatly appreciated.

"If it will be necessary to give you a more detailed outline of our contingencies, I will gladly see that you receive same."

The following answer was sent to our subscriber:

"We hope to render to you the service desired. It will be necessary to give us a more detailed outline of your business—how many departments or branches have you in your business? Do you sell other accessories than tires and tubes?

"Let us have a chart of your present General Ledger Accounts. List them as they appear on your General Ledger. If possible, supply us with a recent Trial Balance, Balance Sheet or Operating Statement.

"Send us copies or descriptions of your invoices, Cash Book, Journals, Time Reports, Purchase Record, Job Tickets, Stock Records—in fact, any form used in your accounting system.

shown and think it possesses some special value send us some copies of it.

Ideas are what we are looking for. In the next issue we will discuss the accounts of the automotive dealer and garage man and show how to set them up to make them easy of analysis, so that present worth and profit and loss may be readily shown.

Come on with your questions and suggestions—fire ahead.

Dealers Asked to Help Effort for Repeal of War Tax.

A new appeal to dealers to interest themselves in obtaining the repeal of the war tax on automobiles, repairs and parts is being made by Harry G. Moock, business manager of the National Automobile Dealers' Association, as a result of letters received recently from Congressmen and Senators that there will be a stiff battle in Congress to effect a reduction of classification taxes.

The new opposition comes from the fact that when President Wilson asked for the elimination of taxes on manufacturing, every other line of industry also asked for relief from taxes. Senators and Congressmen are taking the position that some industries must necessarily share the burden. The industry least organized, the industry that makes the smallest protest, usually is the one so burdened. The National Automobile Dealers' Association is contending that there is no justice in making

the automobile bear a greater war tax in peace time than it bore in war time, and objects particularly to the automobile being classed as a "luxury."

"The automobile is a necessity, and if taxed should be taxed only as a necessity and not as a luxury," Mr. Moock says, "Dealers everywhere should write and telegraph their congressmen and senators to vote for elimination of the war tax. Automotive associations and every person in the automobile industry should interest every motor car owner in obtaining the repeal of the tax."

Overland O. H. BOND MOTOR CO.
1825, 1826 Washington
Phones: Home 323; Bell 518

Parsons, _____ 191__

Mr. _____

Address _____

Salesman _____ Car No. _____

| | | PRICE | | | |
|----------------|---------|-------|--|--|--|
| Gasoline | Gals. @ | | | | |
| Oil | Gals. @ | | | | |
| Grease | | | | | |
| Articles | | | | | |
| Work on Car | | | | | |
| Labor | | | | | |
| 198-16 | | | | | |
| O. K. By _____ | | | | | |

No Refund Unless Sales Slip is Returned With Goods

Sales Ticket Devised by Mr. Boody.

system.

"A study of these statements and forms will enable us to locate the trouble and prescribe the remedy."

You may be experiencing the same or similar difficulties. Let us hear from you. We can do you no harm and feel certain we can do you a world of good.

Re-read this article on Sales Tickets, and then send us sample transactions to handle for you. We will have a sales book in the office and will return a properly made out slip. If you are using a different slip than

Prices Will Not Go Any Lower Down

Fundamental Conditions Underlying the Increased Prices Declared to Be Responsible for Present Figures for Merchandise—Increased Money Circulation Lessens Dollar's Power in the Purchase of All Goods

By S. M. How,

General Sales Manager, Haynes Automobile Co.

The majority of America's foremost economic writers stand together on the price question. They practically agree that prices have reached a new level and that they will remain on their new plane for some time to come.

But with all these indications to guide the prospective buyer there still appears to be a marked degree of hesitancy when the time to buy is at hand. Probably the real reason that buyers are not fully convinced about the price question is because of the lack of authoritative information regarding the present economic situation.

The mind of the buying public is being agitated also by the wide discussion of the price matter. Before any final conclusion is reached, however, it will pay those who are deliberately postponing their purchases in anticipation of reductions to analyze the fundamentals underlying the cause for the present price level.

In comparing today's prices, pre-war prices are naturally brought to the mind and it is here where the comparison is not justified, because economic conditions are entirely different. Before the world conflict there was every reason for the then satisfactory prices, but the war has brought about a definite change in prices as it has in so many other vital things.

Today the dollar has a new form; a new meaning to the user. Undoubtedly the most significant change in the dollar is its reduced value in that it will not buy as much as it did prior to the war.

And the reason is easily and simply explained when the increased bank clearings and the many other evidences are considered. The mental picture is complete when we fully realize the fact that a greater number of dollars are in circulation. Today the circulation of money per cap-

ita is far greater than ever before, with the result that prices assume a new form.

When there is a decided plenty of anything then its worth becomes lessened. So rules the law of supply and demand. It is inherently natural to want what is scarce and to pay a higher price for it. Diamonds hold their value because of their scarcity, combined, of course, with their desirable qualities. And so it is with money—with the dollar.

The dollar has and always will have its desirable qualities but unlike the

the cycle of the present price level is complete.

But with the present so-called high prices, there is also an unparalleled era of prosperity in our midst. At no other time in the history of America have conditions been so favorable and have we had so many opportunities at our command. Therefore, why should we procrastinate in our buying when all other matters are in our favor?

Prices will not come down for so long a time that it is almost beyond any one to say just when. Buy now whatever is essential to your welfare, for the value of an article is dependent always on its actual worth to you when you need it most.

If your procrastination is due to the belief that prices will soon descend it is well to consider the combined opinions of the many who have diligently analyzed the situation. They agree that prices have reached a new business level where they are bound to remain for an indefinite period.

Government Not to Dump Surplus Cars and Trucks on Market.

That the Government has no intention of dumping its surplus cars and trucks on the market is proved by the notice given below, which was recently sent out by the National Automobile Chamber of Commerce.

"The War Department authorizes publication of the following: (Official.)

"The Director of Sales has approved the transfer of the entire present surplus of serviceable motor equipment held by the army in the United States to other Government Departments.

"This action is in accordance with Congressional policy as outlined in the Post Office Appropriation Acts approved July 2, 1918, and in February 28, 1919, and Act approved March 3,



S. M. How, Who Believes that Prices Will Not Come Down.

diamond, its circulation has increased unabated. This has lessened its purchasing power. With many dollars to trade with, everybody in the business world, virtually speaking, has been more or less directly responsible for the present trend of prices.

The cost of labor is higher than heretofore. It, therefore, follows that the goods labor manufactures must cost more to produce and sell. Food and clothing prices are also higher because labor costs more and so it goes, one contingent upon the other, until

1919, authorizing the Secretary of the Treasury to provide hospital facilities for discharged soldiers, sailors and marines. By the appropriation act of July 2, 1918, authorization was given for the transfer of surplus motor equipment to the Post Office Department, and the Act of February 28, 1919, embraced similar authorization for the transfer of any part of this surplus stock to the Department of Agriculture. By the Act of March 3, 1919, the Secretary of War was directed to transfer surplus motor equipment to the Public Health Service.

"The transfer disposed of approximately 39,100 vehicles, including 3,600 motorcycles, 5,500 passenger cars and

about 30,000 trucks. The Post Office Department will receive 10,064 of these vehicles; the Public Health Service 1,396, and the Bureau of Public Roads, Department of Agriculture, 27,983.

"Because of their special design or condition, a very limited number of passenger cars and trucks included in the surplus stock has already been found to be unserviceable for Government use. These and such others as may later be culled out for similar cause in the course of the inspection, which will be made incident to the transfer to the other governmental agencies, will be sold at public auction at the various camps and storage yards at which they have been col-

lected, after the sales have been duly advertised through the press.

"ERRONEOUS REPORTS, to the effect that the War Department would offer to the public a large stock of motor equipment, including new passenger automobiles, have been widely circulated. It was never the intention of the War Department, in view of above mentioned acts of Congress, to so dispose of its motor vehicles. It has consistently followed the policy of transferring all such vehicles as promptly as they were declared surplus, to the Post Office Department, the Department of Agriculture, the Public Health Service, or by sale to other governmental agencies requiring such equipment."

Dealers' Paper Good at Federal Bank

National Retail Trade Organization Requests St. Louis Reserve Institution to Obtain Ruling on Commercial Obligations of Dealers Who May Desire to Take Advantage of the Rediscount Facilities of Federal Reserve Banks

By Harry G. Mook.

Business Manager, National Automobile Dealers' Association.

An automobile dealers' commercial paper is just as good at a Federal Reserve Bank as that of a dry goods merchant, or a machinery man or that of a packing house, according to information sent to the National Automobile Dealers' Association by the Federal Reserve Bank of St. Louis, quoting a Reserve Bank ruling uniform throughout the United States. The acceptance of the paper is based upon the same principles that govern the acceptance of the paper of every other business, that is, the dealer individually must be a good risk and the collateral approved.

Recently some misunderstanding has arisen as to the policy followed by the reserve banks toward the automobile dealer. It was to clear up this misunderstanding that the dealers' association took up the question with the reserve banks.

The reserve bank does not concern itself directly with automobile dealers' paper. The general procedure is that when a dealer sells a car on time he takes a note for the balance of the purchase price, secures this note by a mortgage on the car. He then takes

this note to the bank where usually he sells it. Before selling the note to his banker he endorses it himself.



Business Manager H. G. Mook of the National Dealers' Association.

When the bank wishes to replace the money taken out of its vaults for the dealer, it goes to the Federal Reserve Bank with its own paper, with the note turned in by the dealer as

collateral for deposit. This means then that the Federal Reserve Bank has as its security first the paper of the member bank, then the security of the member bank as guarantor of the customer's note, then the indorsement of the dealer on the customer's note and lastly a lien upon the car, affording it virtually a four-ply security.

The reason for some of the inference against the automobile dealers' paper with the Federal Reserve Banks is believed to have been the result of a ruling refusing to take the paper of a New York automobile finance corporation some time ago. The ruling in no way affected the finance corporation's ability to obtain loans on its security, it just kept this security from being rediscounted by reserve banks.

This ruling was in no manner a reflection upon the finance corporation, but necessitated because the charter of the Federal Reserve Banks, as contained in the Act of Congress creating such banks, prohibited the lending of money to other than industrial, agricultural or commercial purpose. This automobile finance corporation was held not to be in the classification.

Practical Hints for Shop Mechanics

By G. L. Shelley

Bins for Small Parts.

Every well organized repair shop should be equipped with suitable bins or places in which to keep small parts, such as nuts, screws, bolts, gaskets, washers, etc. A very inexpensive and convenient arrangement can easily be constructed of tin drawers sliding into grooves, with sufficient space between so the contents can be seen without going to the trouble of removing each drawer in order to find the particular part desired.

The bins or drawers are cut from a single piece of tin, turned and soldered at the corners and around the top rim, the rim being wide and strong enough to slip into place in the rack. The rack is made by making grooves with saw and chisel in planks, the number of planks used depending upon the number of vertical tiers desired. These vertical planks should be firmly secured to a horizontal plank at the bottom and one at the top, thereby insuring a solid and convenient receptacle for parts of various sizes and kinds.

* * *

Socket Wrench.

The handiest, and most often in demand, tools in a repair shop are those that seem to have a way of disappearing. If

To Straighten Rear Axle.

It is not always necessary to remove a bent rear axle from the frame in order to straighten it. A very useful rig to be used in this connection can be made with an H-shaped section base (similar to that of an ordinary railroad rail). This base should carry two upright threaded pieces, with a cross piece for the purpose of holding the end of the bent shaft, and a notched upright board, used as a fulcrum, and which acts as a brace between the housing and the base. Remove the wheel of the bent axle and turn the shaft until it is in the top position. Then place the above described rig in position and tighten the nuts on the threaded uprights until the bent shaft is brought back into its correct position.

* * *

Cleaning Wheels for Repainting.

The ordinary method of removing paint from wheels before painting is to apply the remover with a brush and then the paint must be scraped off. With this method a workman can clean only about two sets of wheels a day.

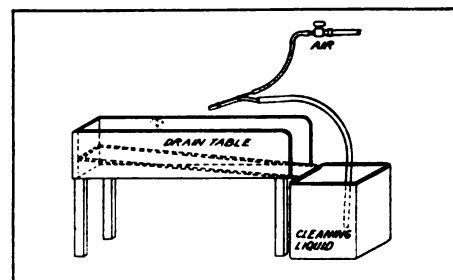
When there is need of haste a great deal of time can be saved by constructing a large cylindrical vat, partially filling same

should be able to readily clean eight or ten sets of wheels in one day.

* * *

Air-Pressure Cleaning.

The quickest way to remove dirt and grease from automobile parts is with gasoline, or preferably kerosene, because it does not evaporate so fast, forced by air pressure, thereby producing a spray. A device for doing this can easily be constructed by arranging a cleaning table consisting of an inclined cleaning trough, with a metal tank so placed underneath the



Apparatus for Air Pressure Cleaning.

trough that the cleaning liquid will run into the tank and be used over and over again on the parts to be cleaned. The dirt will of course settle to the bottom and can later be taken out.

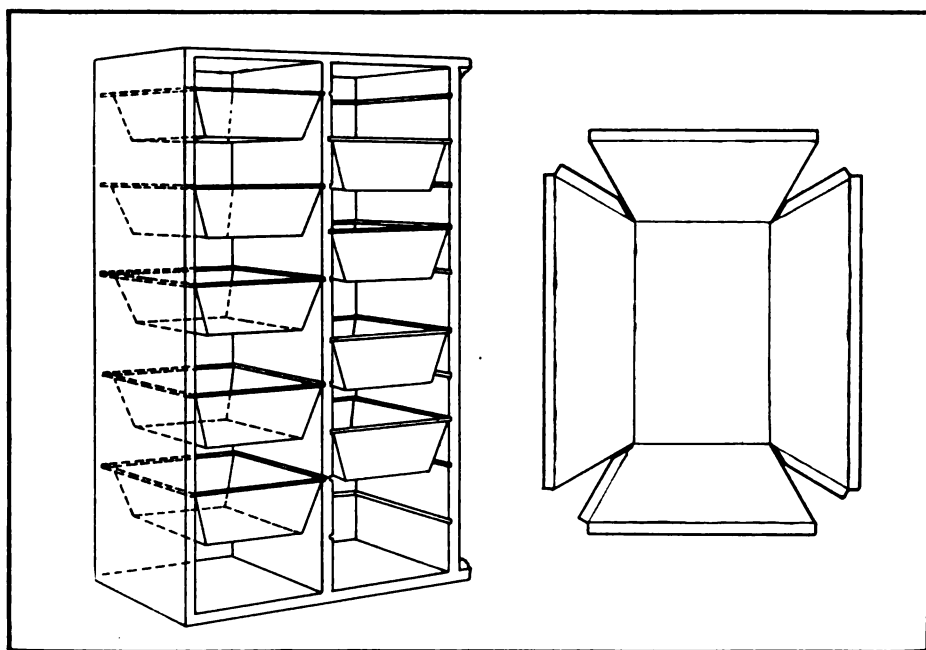
An injector type nozzle, with one connection to the air line and another to the liquid, will draw the liquid from the tank and force it on to the parts being cleaned. This contrivance can also be used in cleaning an engine by connecting the spraying nozzle to the air line and to an ordinary two gallon kerosene can placed on the floor, using tubing of sufficient length to permit the operator to move the nozzle freely about the engine.

The sprayer can be made of a short length of 1/4-inch copper tubing with a piece of 1/16-inch brass tubing soldered to the side. The air line is connected to the larger, and the cleaning liquid to the smaller tube.

* * *

Storage for Fenders.

When necessary to store fenders, they should be placed somewhere entirely out of the way so as not to become damaged. By constructing a rack for them in the ceiling they are not only out of the way, but very little space is taken up. Such a contrivance can be made from two-by-fours suspended from the ceiling beams with cross parts of same. The fenders should first be wrapped in heavy paper and rested in this suspension. This structure can be used not only for fenders, but other parts as well.



Tier of Bins and Sheet of Tin Prepared for Soldering Into Required Form.

this particular tool happens to be a socket wrench the mechanic can easily make one by placing a bolt head of the proper size in one end of a pipe and then forge the pipe to fit it. A hole should be bored in the opposite end to take a crosspiece, and the tool is completed.

with the paint remover, and a faucet at the bottom which permits of the vat being emptied when desired to be cleaned.

After the wheels are allowed to soak for a time in this vat the paint will become so soft that it can be very easily removed, and with this method one man

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"Yes, that's the trouble, but the ROSE TIRE PUMP does not have a brass barrel and will not dent or jam in the tool box."

"Is the base cast iron?"

"It is not. The base is machined from solid screw stock and the stirrup folds along side the barrel."

"Will the barrel rust?"

"Most assuredly not. The barrel is enameled and baked."

"How about that hose?"

"That hose, my dear sir, is the best I ever saw on any pump, 17/32 outside measurement and 3/16 inside with an inner wall of pure para rubber and 5-ply extra tested fabric."

"Many Rose Tire Pumps sold?"

"Over 1,500,000 in use. Nearly every jobber and dealer in the United States stock Rose Tire Pumps and a full line of repair parts for them."

"That looks good to me. I'll just take it along. How much money?"

"Only \$3, and you have a pump that will give you satisfactory service for five years. By the way, how much service did you get out of the pump you got with your car?"

"Eh? Service, did you say? You can guess. I must go, the folks are waiting. Good-bye."

Manufactured and Guaranteed by
J. H. HANEY & CO., Hastings, Nebraska

To Remove Dust.

A very good method to remove rust from automobile parts is to make a solution of one part sulphuric acid to ten parts of water. After dipping the articles into this mixture, withdraw and dip them into a bath of hot lime water, holding them there until they become heated to the extent that they will dry immediately when taken out, then rub thoroughly dry with bran or sawdust. It will be found after applying this treatment that the parts will be perfectly clean and in a condition to be painted with fireproof paint, blued or nicked, or if desired, can be left as they are.

* * *

Repairing Ball Bearings.

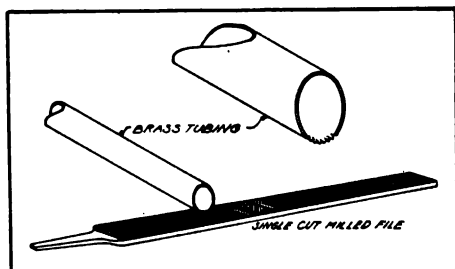
A word to the repairman who discovers in the course of his work upon a motor car that the ball bearings have become worn. This does not necessarily mean that they are a complete loss to the owner. Instead of installing a new set of balls, true up the races, and then put in a new set of over-size balls of the size required.

* * *

Novel File Cleaner.

Single-cut milled files are easily and absolutely cleaned with a short piece of brass tubing in the following manner: The short piece of tubing is pushed back and forth across the file in the direction of the milled grooves as shown in the accompanying drawing. As the tube is moved across the file the curved edge of it will be cut into saw-like notches by the teeth of the file. The notches thus formed soon reach the bottom of the milled grooves to remove every bit of dirt or metal filing accumulated there.

The device is much better than a file brush because it cleans the bottom of every groove. It will remove lead, zinc, or other metal filings that clog the teeth of a file in cases where the brush will not. When the edge of the tubing wears out it can be renewed by grinding



Method of Making File Cleaner.

or sawing the end back a fraction of an inch.—David Baxter, Hutchinson, Kan.

* * *

Steering Wheel Support.

When supporting the base of the steering gear in a vise for the purpose of repair work, it will be found very advan-

tageous to steady the wheel in some manner. A very good arrangement for this purpose can be constructed by using the lower part of a tripod music stand together with the set-screw, which provides for the upper part to be adjustable. Use a steel rod about three feet long of such a size as will slip into the tripod stand, the upper part of which should be shaped into a horizontal double "V," into which can rest the steering rod close to the wheel, and the rod adjusted with the aid of the set screw to any height that may be required.

* * *

To Discharge a Battery.

Should occasion arise where it may be necessary to discharge a battery, which must be done to make a test, a very good way is to lead the terminal wires to a wooden pail containing water into which a few handfuls of salt have been dissolved. The wire terminals should, of course, end in metal plates which should rest upright in the water and against the sides of the pail.

Be very careful that the plates do not get too close together, as this may short the battery. Owing to the fact that the more salt used and the closer together the plates are set will cause a rapid discharge, it is evident that the discharge can be con-

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—American Garage & Auto Dealer, 116 S. Michigan Ave., Chicago, Ill.

trolled with the amount of salt and position of plates, and if it is desired to watch the discharge, an ammeter can be connected in the circuit.

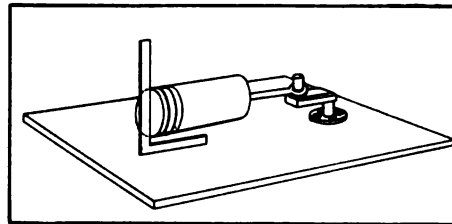
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To Soften Battery Composition.

A very simple method of softening the composition in the top of a battery so as to remove the battery top can be contrived, for use in either a private or public garage, in a very few minutes, and should be kept on hand for emergencies. The articles necessary are a small gas plate, and a kettle, the top of which should be soldered, and about three outlet tubes soldered into the spout, each tube leading into a battery cell, thereby enabling the steam to be applied with full force. The acid should, however, first be removed.

To Test Connectingrod Assembly.

A good device can be made for use in the repairshop in testing the alignment of the connectingrod assembly. Cut a discarded crankshaft just forward of the rear connectingrod bearing; use a flywheel flange as a base to bolt the dummy crank thus formed to the faceplate.



Testing Connectingrod Assembly.

To use this device, attach the assembly which is to be tested, to the bearing, and a square resting on the faceplate and against the top of piston will determine whether the top of piston is parallel with the crankshaft bearing. Do not overlook the fact that the dummy crank must be bolted to the faceplate absolutely true in order to insure that the test will be accurate.

* * *

Motor Stethoscope.

A very useful time-saver for the busy repairman in locating motor knocks is a stethoscope, and this can be made at very small expense, and will prove very powerful. Make a cylinder of any kind of material, about four inches in diameter and the same in length. To one end of this chamber attach a rod of sufficient length that it will touch the motor, and from the other end run two rubber tubes which are to be placed in the operator's ears.

The end of the cylinder to which the rod is attached should be made of shim steel about .007 inch thick, while the rod is attached to it by riveting. The operation of this device is easily explained: The rubber tubes are placed in the ears, and the rod rested on that portion of the car from which the noise appears to be coming. The vibrations passing from the motor along the rod to the steel end of the cylinder are sufficiently strong to set the air in the chamber in motion and communicates the sound with the ear tubes. This simple device will enable the mechanic to locate a knock quickly, without which considerable time for so doing might be required.

* * *

Remedy for Creaking Springs.

A very good means of correcting squeaks in springs is the use of equal parts of heavy lubricating oil and kerosene, same to be applied to spring leaves by means of a spray. It will be found that the ingredient of kerosene will evaporate after having been applied for a few hours, and the oil has so penetrated the parts as to stop any annoying squeak.

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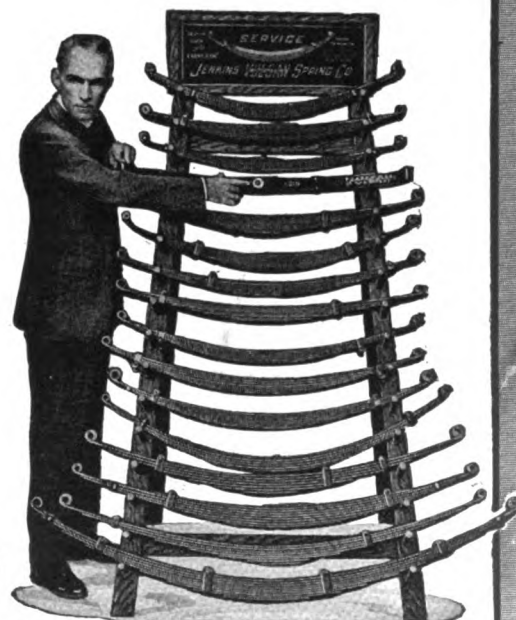
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Welding, Cutting and Brazing Practice

Ways of Preparing Cracked Ford Engine Cylinder Head for Welding Are Described and Methods to Be Followed During Progress of Work Explained—Directions for Keeping Temperature Even Throughout

By David Baxter

A Ford cylinder head is one casting that is almost certain to come to every automotive welding shop for repairs sooner or later. This is due partly to the fact that the Ford is a car which receives probably more careless treatment than any other automobile. It is a car without a house; left to shift for itself outdoors in all kinds of weather.

As a result a great many cylinder heads are frozen and cracked.

What makes this more noticeable is the immense number of Fords in use. Out of this large number there are bound to be many with cracked cylinder heads, not to speak of other broken parts. Therefore, as I said before, the automotive welder will sooner or later meet up with a cracked cylinder head of a Ford engine. So, let us discuss the ways and means of welding them. There can be no doubt but that there are numbers of cracked cylinder heads in each welder's district.

This little casting is so simple and innocent in appearance one would scarcely think there could be any trouble connected with welding it. But as with many other things, appearances are deceptive. Ford cylinder heads must be preheated and welded right if the casting is to be kept from cracking back, if the weld is made to hold. The crack usually occurs along the top in

There are probably several arrangements for heating and handling the casting other than the method described herein, but I think any welder will agree this is about as simple and safe a method as any. At least he can produce satisfactory results by following the instructions given here.

In order to make this instruction as simple and clear as possible, let us take the cylinder head illustrated in the accom-



Fig. 2—Showing Arrangement of Preheating Device.

panying pictures and follow the welding procedure as it was accomplished in this particular instance. A step at a time from the arrival of the cracked job at the shop to the finished weld ready to go back on the car.

First, a description of the job: It was to weld a crack half the length of the head running along the top of the casting to a short curve down one side of the top. It was necessary to weld this crack so that it would not leak either in the weld or through pin holes in the new metal added. Since the metal was less than a quarter of an inch thick in the casting top, a clean, solid weld was not so easy as it looked. The double-walled construction of this head made the preheating also a problem in its way.

Nearly all jobs of welding require a certain amount of preparation. Sometimes more; sometimes less. To properly prepare a Ford cylinder head for welding is to do half the work. To attempt to weld it without any preparation will usually spell defeat; either a leaky weld or an open crack when the weld cools.

In the case illustrated the head was pre-

pared for welding by first cleaning the line of the fracture for a space of an inch or more each side of it; all rust, grease and dirt were scraped off, exposing the bright bare metal along the crack. This cleaning was for the purpose of preventing any harmful foreign substance from being absorbed by the melting metal of the weld.

Next, a heavy square file was used to cut away, or chamfer, both edges of the crack until it formed a wide V-shaped groove the full length of the fracture and extending to the bottom of it. In other words, the groove was made to the full depth of the metal thickness. This was essential in order that the full thickness of the metal could be fused. The width of the groove at the top equaled the distance of the thickness of the metal.

This grooving affords the welder an opportunity to make a strong, homogeneous weld by commencing at the bottom and melting the sides down as the new metal is added. The grooving might have been done with a hammer and cold chisel, but there was danger of breaking a section out of the cylinder head. So a sharp file was employed to cut out the groove metal.

After cleaning and grooving, the next step was to heat the job in preparation for the welding. This was for the double purpose of economizing welding gases and expanding the head so it would contract when the melted metal of the weld contracted. In other words, the preheated casting would melt and weld easier under the torch if it was hot before the torch flame was applied.

By expanding it before applying the welding flame there would be no sudden expansion when the weld started to melt. Also the hot weld could not contract away from the casting, as would be the case were it welded cold, thus opening the crack or causing a new one. The idea was then to preheat and expand the whole thing, thus giving the casting a chance to follow up the contraction of the weld, when the job cooled.

To preheat the head, it was placed upon two fire bricks as shown in Figure No. 1. The gas burner used for preheating is also shown underneath the casting, which was placed with the break upward an inch or so above the fire. When the gas was lighted it would envelope the whole job.

An oil burner would have been just as effective for this heating as the gas. In absence of both gas and oil the welder would have used a charcoal fire beneath

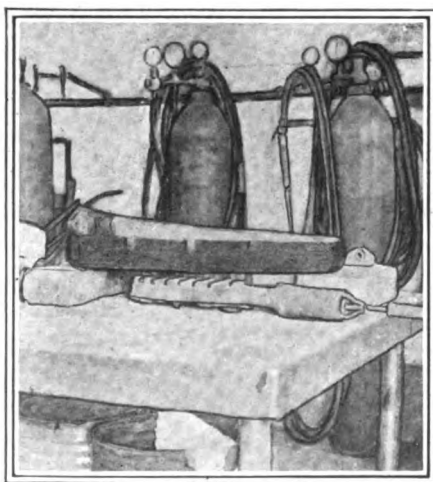


Fig. 1—Showing Position of Head and Gas Burners for Preheating.

about the same place on every head, although it often varies in length and sometimes branches out into several shorter connecting cracks. But for long or short, simple or complex, the heat treatment and welding is practically the same on all heads.

GENERAL *Lightning Cut* PISTON RINGS

in conjunction with an
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Not Just Another Piston Ring

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It is our privilege to introduce the GENERAL LIGHTNING CUT PISTON RING as the last word in piston ring improved design and construction.

Distortion during expansion has long caused most piston ring troubles. The General Lightning Cut Ring is of concentric design, constructed of fine gray iron, not pot but **indivisually** cast, with the scale remaining on the inside. It has a uniform tensile strength and an evenness of expansion that closely approaches the long sought solution to this problem of distortion during expansion.

With an evenness of expansion equalled per-

haps only in one or two other makes, there has been added a feature that leaves the Lightning Cut Ring supreme in the field of piston ring performance. That feature—that step in the progress of ring manufacture—lies in the kind of cut and oil groove used.

The Lightning Cut Ring obtains its name from the peculiarly cut slot—a cross between the old diagonal and the step-cut slots. This ring, with expansion troubles foreseen and met in its concentricity, its construction and its casting—has this cut of a new type for an old and long sought purpose. And it is this cut in combination with its evenness of expansion and its irregular oil groove, reduces the loss of compression to a minimum.

For while this oil groove affords ample means of lubrication—on the upstroke, it will, on the downstroke, scrape off the surplus oil without scoring the cylinders—a condition long sought and muchly needed.

Not to Be Marketed in the Usual Way

Details of our new sales plan are about completed. We have determined upon a sales policy that will introduce this Lightning Cut Piston Ring to the public through a distribution plan never before equalled in the automotive field. True from the standpoint both of fairness and of profit for the dealer.

In the meantime jobbers and dealers are cordially

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This new LIGHTNING CUT PISTON RING will be furnished in all sizes, packed in oil-proof envelopes, placed in cardboard cartons of a rugged make, attractively labelled to help dress your shelves. A practical and attractive piston ring cabinet is furnished for display. Write today for details.

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the casting in the space occupied by the gas burner.

The next step in the preheating operation was to place a few fire brick around the head and burner, in the manner illustrated in Figure No. 2. The whole thing was covered with scraps of asbestos paper forming a sort of oven. This oven-like structure was for the purpose of confining and conserving the heat and hurrying the heating. Also to protect the job from accidental cold blasts of air while the welder worked.

By confining the heat the casting is caused to heat faster, which results in the welder being able to melt and fuse the weld quicker, saving both welding and preheating fuel. The head was allowed to heat in the brick oven until it was red hot all over before applying the welding flame. This stage of heating is easily seen by raising the edges of the asbestos scraps and peeping under them. The casting was red hot in every part before the torch was lighted.

The preheating gas was permitted to burn during the welding and for several minutes afterwards; this to insure against contraction cracks. A torch fitted with a medium-size tip was employed, utilizing the standard neutral flame. First, the flame was placed in contact with the upper end of the crack through an opening made in the asbestos covering. An inch of the bottom of the groove was melted and flowed together. Then the filler rod was brought into the melting groove.

The two metals were melted and mixed together and welded to the sides of the groove. The flame was never held in one spot very long nor was the filler rod held motionless long at a time. Both worked together to knead and mix the metals into one solid mass. Then another inch was treated in the same way, followed by another inch at a time until the length of the crack was welded.

Each inch was but a continuation of a previous one. That is, each inch was a part of the one following, not a string of separate little welds joined together, as it were. The continuous effect was secured by a clever manipulation of the torch and filler to that end.

As the weld progressed a slight surplus of filler was piled on top of the weld and sloped to join the sides of the groove. This juncture was thinned to a feather edge so there could be no miswelded portions.

A patent flux powder was used to float the slag and dirt, which was blown away by the pressure of the flame or picked out with the filler rod. Only such part as was being welded was uncovered while welding; as fast as an inch was completed it was covered with the asbestos again.

When the last inch was finished, the whole thing, casting and oven, was covered tight with asbestos scraps. It was

allowed to remain thus until it would no longer fry drippings of water along the outer edges of the head. This cooling process requires longer time on some heads than on others, but it is not always safe to judge the cooling by the time it



Fig. 3—Cylinder Head after the Welding is Completed.

remains in the oven. The water test is better, or the bare hand.

When the casting would no longer burn the bare hand it was removed from the furnace and examined for defects. None being present, the weld was rounded over nicely by grinding on an emery wheel. Figure No. 3 shows the welded cylinder head ready to be put back on the engine block. Almost as good as new and certainly as strong.

* * *

Advice on Installing Electric Welding Outfit.

Question: I am a tire repair man but am, however, starting to install an electric welding outfit and am writing you to ask a few questions.

In the first place I propose to operate the welding outfit off a 60 volt direct current motor generator that I am using to charge batteries. I propose to set in two resistance units in the welding line, but so far this is an experiment, rather than a fact. I understand that this is current enough to do welding but am not sure of it. Can you give me any help on forming the arc, or rather in hooking up the line to produce the arc?

Do you believe this outfit will prove practical for light welding? Is it not true that an electric welding outfit is better than a gas outfit?

Myself and foreman are good mechanics, but are mighty light on welding knowledge, except from what we have gotten from your articles in the American Garage and Auto Dealer. Can you give me the

title and publisher of the best book on welding, especially on electric welding?

There is a big chance for a welding plant here if the operator understands his business and is ready to give service. We know so little about welding that it is virtually nothing, but propose to study the technical end by the book route, and experiment on old stuff until we are proficient to handle anything. I expect to have trouble but believe that a lot of this can be overcome by hard study, etc. That is why I want a good book.

I am willing to go to a school or send a man but all the welders I know have been to the so-called schools and they are no good. Is that the way to do? This is a queer sort of letter, but I want information and don't know how to go about getting it only as above. Briefly our main trouble is knowing how to hook up the current we have and where to get a technical work on welding. I have all your articles on file and expect to receive a lot of help from them also.—L. J. M., N. Y.

Answer: Replying to your questions in their order: You probably can use the 60 volt current you mention for welding purposes if properly installed, although there may be other difficulties to contend with other than the simple fact that the current is of correct voltage. With no more information than is given I cannot give instructions for hooking up the line to form the arc. And since the proper control of the arc is the main thing in electric welding the proposition appears to be doubtful.

I do not believe such apparatus will prove practical, especially as you confess you know nothing about the process. You should purchase a factory outfit if you prefer electric welding.

To the best of my knowledge and belief the arc welder is not as good as the gas welder for general repair welding. A good arc welder is better than gas on a few special kinds of work, such as thin copper and sheet metal jobs. But for all classes of work I advise the oxyacetylene process.

Probably the best book you can get on welding is AUTOGENOUS WELDING by R. Granjon and P. Rosemberg. You can obtain this from the Acetylene Journal Publishing Co., Peoples Gas Building, Chicago, Ill. Or you may get cheaper books on this subject from the same company. The Lincoln Electric Company of Cleveland, Ohio, will undoubtedly furnish an instruction book on the subject of arc welding if you will write to it.

I quite agree that a lot of "school welders" are at least not what they should be. You have probably chosen the best way to learn welding—reading, studying and practicing. At least it is a way open to all. Of course a man must use his own head in connection with anything he reads or he won't get very far. Any further information required will be cheerfully supplied upon request.

TREX

The Only *Practical* Tire Tool



HOW TO REMOVE THE TIRE

Let the air out of the tire and unlock the rim. Then place the front hook of the TREX over the rim, 4 or 5 inches from the split, as shown above, also hooking the rear end onto the rim. Move the lever handle several times and the rim will "break" open.

Then release the hold and place the TREX straight across the rim, that is, so that the split is midway between the ends of the tool. Then move the reversible ratchet on the handle to forward position and the rear pawl to engage with the ratchet wheel, while the front pawl is in the neutral position. Work the lever handle back and forth until the rim is collapsed to the desired distance, and then remove the tire—it will come off easily. The TREX will hold the rim collapsed until you are ready to replace the tire.



HOW TO LOCK THE RIM

Rims having special locks will require one more operation. Shift the TREX into place, as shown above. The front and rear pawls must be in the neutral position while the reversible ratchet remains as before. Place the front end of the TREX against or near the lock of rim and the rear end against the opposite side. Then, by moving the lever handle back and forth, the locking parts are forced into position and the rim is locked tightly in place.

The TREX Compressor placed in the same position shown above will loosen any lock, no matter how rusty or stubborn, so that it can be easily unlocked.

Saves Time, Tires and Temper

NOTE THESE BIG ADVANTAGES

The TREX compresses the rim so that the old tire can be removed, and then forces the rim into place so that it fits the new tire snugly.

Tire changing with a TREX is a simple job. You do not have to get down into grime and dirt.

It works like a jack and is easy to operate.

In less than five minutes and without exertion, you can remove, replace and lock the rim.

The TREX Compressor is self-adjustable to any size tire. It fits every kind of split rim.

With a TREX rusty and twisted rims are no harder to remove, replace and lock than perfect and new rims.

It does not injure the rim, or spring it out of shape, and eliminates all danger of pinching the inner tire tube.

The TREX Compressor has no clamps or screws, so there is nothing to fasten or adjust.

It is made of malleable iron,—is light, strong and durable.

TREX is the best, most practical and efficient tire tool made.

DEALERS—Here is the tire tool your customers have been looking for.

Write today for full particulars and the name of our nearest jobber.

THE TREXLER COMPANY

MANUFACTURERS and DISTRIBUTORS of PRACTICAL MOTOR CAR ACCESSORIES

Factory and Sales Office: Philadelphia, Pa.

Western Branch: 2111 S. Michigan Ave., Chicago

Branches in Boston, Detroit, New York, Cleveland, Pittsburgh

How to Make the Shop Profitable

Complaints about Conduct of Employees in Parts Department Force Reorganization of Methods of Handling Orders so that Telephone and Telegraph Requisitions Have Precedence—Stock Is Condensed

By E. B. Hinrichsen

When Bill was in charge of a shop only he received a good many complaints, both from customers and from his own men, in regard to trouble with the clerks in the parts department. These complaints covered discourteous treatment, lack of inclination to aid the customer in identifying the parts wanted and lack of knowledge of the work they were hired to do.

After the shop began to show an inclination to run itself, Bill began to get in on the parts. He had to use much caution as the parts department manager was one of those individuals who believed that the workings of his branch of the business should be known only to himself. He had been in charge of the parts department of the largest dealer and been placed at the head of the consolidated department.

His attitude toward the public was one calculated to cause antagonism. He was one of those unfortunates who had fallen into a rut and had idealized detail to such an extent that the art of salesmanship and courteous treatment of his customers had been lost sight of. This feeling was naturally communicated to his subordinates with the result that the parts department was decidedly unpopular.

Every move had to be made according to certain routine. No emergency was great enough to cause any deviation from the set rules.

Drastic Measures Needed

Both Bill and Mr. Brown tried diplomacy for a time but it was soon evident that more drastic measures would be necessary. Bill spent a few weeks studying the parts problems and then started on the reorganization, regardless of whose feelings he might hurt.

Old practices which had become obsolete were ruthlessly thrown out. New routines were established that permitted orders to go through much faster and allowed emergency cases to be expedited. If an order was required to take care of a serious delay in service, this order received precedence over all others and was followed through until the parts were in possession of the user.

Telephone and telegraph orders always had right of way and window sales were handled in regular rotation. Every effort was made to get the correct parts wanted and if through error or lack of information wrong parts were delivered, replacing shipments were made immediately without argument instead of waiting for the incorrect parts to be returned.

The window salesmen were thoroughly instructed on parts and were required to be familiar with all those they handled. They were instructed to give every assistance to the customers and to be sure that the correct part was delivered.

The parts charts were referred to in all cases where there was any doubt. In case the wrong part or parts had been delivered and afterward brought back, the exchange was made without question. The returned goods were turned over to the claims man, who turned them back to the parts stock in the regular manner in order that the inventory would be kept correct.

The various parts were split up among a number of men, the classification being based mainly on the makes of cars. Each was responsible for his stock and his own inventory clerk kept the stock record.

Card Index Record Used.

This record was in the form of a card index and showed the quantity on hand, the price and the location of each and every part. When stock was drawn, the clerk made the proper notation on the card, showing the number left in the bin and when stock was received the proper notation the increase in stock.

At intervals the card inventory was checked against the actual stock and any variations between the inventory and the stock corrected. The causes of these variations were also found when possible, and measures taken to prevent them happening again.

Bill discovered that a great many of the parts for the various makes of cars were interchangeable. For instance, two or more makes of cars used the same size and type of universal joints, drive shafts, springs, gears, etc.

Duplicate stocks of such parts had been carried, classified, and located by the name of the cars. A list of such parts was made up and all interchangeable parts put in one stock. It was surprising how the stock could be cut down in this way and how much space could be saved.

The claims and returned goods man had been a part of the parts department organization. As such, he was naturally inclined to favor his old department in making adjustments. He often made his settlements in such a way as to work an injustice to the customer, although when defective parts were returned to the factories the parts department would benefit.

Bill put him in a class by himself. He was directed to use some judgment and

take all angles of the game into consideration in making his adjustments. He was given to understand that it was better to make a settlement at a slight apparent loss than create a dissatisfied customer. His decision on such affairs was supposed to be final. Both the customer and parts department had to abide by his ruling.

It was a difficult position to fill. Bill and Mr. Brown had to give a great deal of supervision to the man before he learned to go ahead alone, but eventually things ran smoothly.

In both the parts and claims departments a different feeling was instilled. The policy of considering that the customer was always right was adopted. Both Bill and Mr. Brown never ceased drilling it into them that they must conduct affairs as though they had the strongest competition to contend with and did not have a monopoly on their class of business.

Wilcox Sums Up Whole Case of the Rural Motor Express Idea.

Seven words sum up the whole case of the rural motor express, according to G. D. Wilcox, director of sales and advertising of the Commerce Motor Car Company.

"The farmer cannot produce and transport, too."

"These words are the keynote of a bulletin just sent out by the national motor truck committee of the National Automobile Chamber of Commerce, Inc., of New York, and they tell a tremendously important story of the vital factor in the most necessary of all industries—agriculture," says Mr. Wilcox.

"That factor is transportation. Time was, in the olden days, when a farmer could then take a day off every week or so to truck his produce into town markets.

"But a day now is important to every man, and it has been demonstrated year after year that the farmer cannot efficiently—and the word is to be noted—cannot efficiently produce and transport, too. To quote from the bulletin:

"We work with feverish haste to push steel rails to the mines, the steel mills, to every city, so that our manufactured products can reach the market, or perhaps tidewater for reshipment to all parts of the world. But you are neglecting the most important of all, which is agriculture.

"We have failed to modernize transportation to the rural districts, which, up to now, remained as it has always been—a relic of the past, in a world which is twentieth century in character."

Introducing the new Duracord Portable Hand Lamp

A lamp with an extraordinary cable

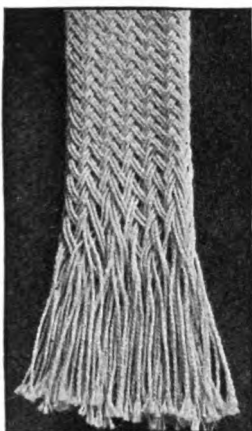
THE weakest part of most hand lamps is the cord—the part that gets the most wear and should be the strongest.

Here's a new lamp with an entirely different kind of cord. A cord that you can pull round corners and over sharp edges, walk on it, drop tools on it, drag it through oil and water—with no more injury than ordinary wear and tear. It will outlast ordinary cords 4, 5 and 6 times.

This cord is Duracord. The same cable that is used by the Cadillac, Hudson, Dodge and Ford automobile factories, big ship building corporations and other great industrial plants, for their portable tools.

DURACORD EXTENSION LAMP

Duracord will not break open as a steel armored cable will when kinked or crushed. There is no sharp metal edge to cut through to the wires, causing a short circuit or a dangerous stream of electricity on the outside of the cable. It will not scratch painted or enameled surfaces.

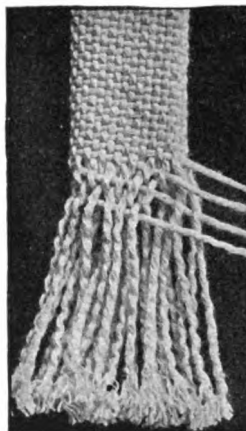


Here is the ordinary braided cable covering. Note the open and porous construction, easily cut, stretched or unravelled. Compare it with Duracord.

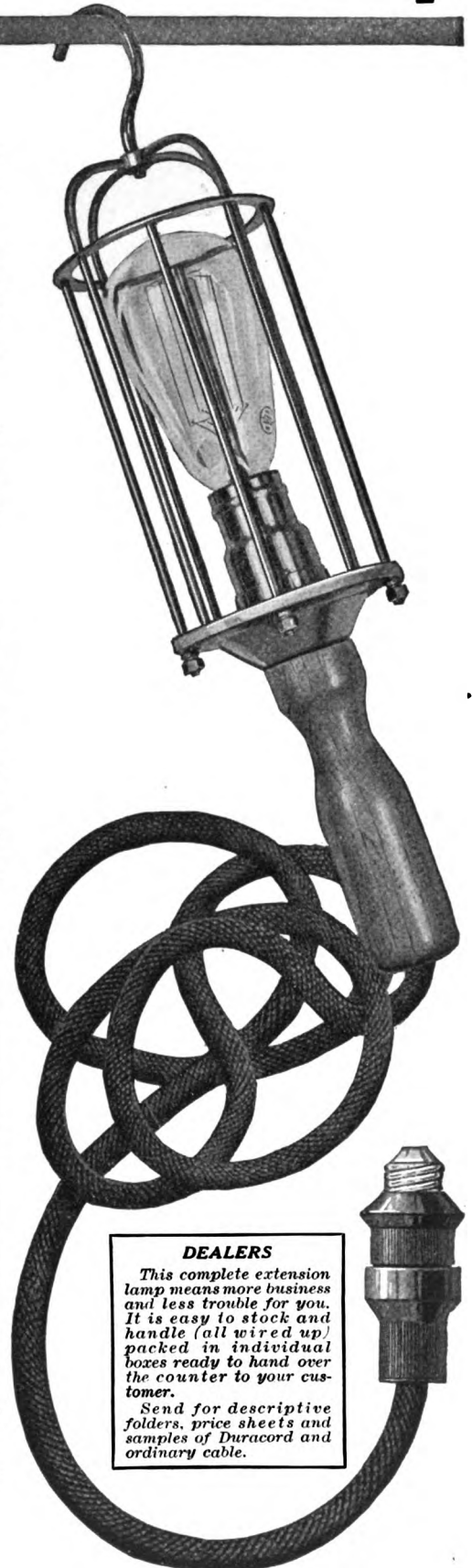
The 20 foot cord is gripped in the lamp by a patented "hold fast" fitting which positively prevents the wires pulling away from the terminals.

Remember, the Duracord lamp is *complete*—wired up, packed in an individual box. Everything except the bulb. The illustration on this page is an exact photographic reproduction. See the actual lamp at your dealer's.

Made in 3 designs.
Light weight . \$5
Heavy duty . \$6
(as illustrated)
Vapor proof . \$8



This is Duracord. Thick, heavy strands, woven like a piece of fire hose, not braided. Picture shows outside covering only with impregnating compound removed.



DEALERS

This complete extension lamp means more business and less trouble for you. It is easy to stock and handle (all wired up) packed in individual boxes ready to hand over the counter to your customer.

Send for descriptive folders, price sheets and samples of Duracord and ordinary cable.

TUBULAR WOVEN FABRIC COMPANY
Pawtucket, R. I.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

MUT

America's Gr

is now ready to assign exclusive territory in important distributing centers

We shall be as critical in selecting our representatives as we were in choosing the parts that make the

MUTUAL

"America's Greatest Truck"

(See specifications on next page)

U A L

eatest Truck

Backed by a whole wealthy county—Financed liberally—
Dominated by a policy of progress—Promoted by a liberal
advertising campaign for the Distributor in his territory.

Mutual Super-Specifications

Wisconsin Motor—"UAU" 4½x6.
Wisconsin Worm Drive Rear Axle—Internal Expanding, Concentric - Brake Type.
Sheldon 3 FA 10 Front Axle—Ball Bearing Steering Knuckle Type.
Fuller Model "G" Transmission—4 Speeds forward and reverse; mounted amidship.
Hale-Shaw Clutch — Universal Type, No. 5.
Parish & Bingham Pressed Steel Frame—6" Channel with 3" Flange, ¼" material.
Mather Chrome Vanadium Steel Springs.
Enclosed Cab, "Weather-tite"—Regular Equipment.
Smith Metal Wheels—Regular Equipment.

Ross Steering Gear—20" Steering Wheel.
Spicer Universal Joints—Three in shaft, one contained within clutch.
Goodyear "SV" Tires — 36x4 Single Front; 36x4 Dual Rear.
Duplex Governor—Double Control.
Perfex Radiator—Cast Tank Type, with special mounting.
Vesta Electric Lighting System—Regular Equipment, F2 Generator and Battery, 2 h. l., t. l., d. l.
Bosch Magneto with Impulse Starter—Type ZR4, Waterproof, Dustproof.
Stromberg "M" Carburetor—Latest Type.
25-Gallon Gasoline Tank and 2½ gallon lubricating oil tank.
Complete Set of Tools and Jack.

Sizes—2 Ton—3½ Ton—5 Ton

Compare the above super-specifications with those of the most famous and highest priced Trucks and understand why we are right in calling the Mutual *America's Greatest Truck*.

Mutual Truck Co.

Sullivan, Ind.

Readers' Questions and Answers

By G. L. Shelley

Valve Spring-Lifter.

Question: I am operating a repair shop in which I do a considerable amount of work on motor cars, and have bent every effort to acquire and keep my shop fully equipped with the various kinds and sizes of tools necessary to turn out any kind of work required. It seems an impossible undertaking, however, for the expense involved is exorbitant, and every day or two a job comes in requiring the use of some tool which I find, after due search, has not been included in my equipment.

I appreciate the fact that no customer relishes the necessity of paying for time required by a mechanic in the search for some tool that will do the work, nor do I wish to impose upon him such expense. Only recently a small car was brought into my shop and I was much surprised, in spite of the care I have been taking, that there was no valve spring-lifter, or tool that could be substituted that would do the work, involving much time lost in fashioning a tool for this particular job, and then it was not satisfactory.

I am wondering if you would publish in your next issue just how a valve spring-lifter can be made that can be used on small cars, for which information I will be very thankful?
—A. M. R.—Ind.

Answer: We can readily appreciate the fact that it is practically impossible for a garage or repair-shop owner to acquire every tool necessary to do all kinds of work, and the amount of money that would have to be expended in your endeavors in this direction, yet your efforts are to be commended.

There are valve spring-lifters made for many of the cars now on the market, especially the larger cars, but it is the smaller sizes that are more apt to give trouble. There is also to be taken into consideration the fact that no two cars have dimensions exactly alike and so the tools for one may not fit the other, and this is especially true of valve spring-lifters, such as you suggest.

A very good tool of this kind can be cheaply and simply constructed with the aid of a flat piece of stiff steel one-eighth inch thick and an inch wide. The length should be determined by the car and space allowed by the setting of the engine.

Bring one end to the thickness of about 1/16 inch, and sharpen at the extreme end, enabling it to be inserted underneath the spring. Cut in a slot the width of which should be just the diameter of the stem, with a little clearance, and deep enough to go under the spring and protrude on the other side.

A good way to prevent the tool from

slipping from under the the spring is to make a slight bend in the flat side of the working end. A chain makes the best of fulcrums as it can be adjusted link by link. One end of the chain should be passed through the lifting tool, with a pin or nail inserted through the link on the under side. To the other end of the chain attach a stiff steel hook, which for support, can be dropped into the valve hole, and if sufficiently long will rest against the top of the valve, thus holding it down while leverage is applied against the spring, which will raise it properly, when the lifter can be taken out and the spring and valve removed.

* * *

To Prepare Electrolyte.

Question: I should like to know the

SEND QUESTIONS

Develop inquisitiveness! The more you know about your business the more money you can make. Inquisitiveness means asking questions; the more you ask the better we are pleased.

All readers are invited to write to us when they wish information on automotive subjects. We welcome queries about cars, trucks, tractors, trailers, tires, or anything and everything sold or used by automotive tradesmen and their employees. When a quick answer is desired we will send a reply by mail, otherwise the answer will be printed in this department. Whether you are a dealer, a salesman, a mechanic, a bookkeeper, a service man or a stock-keeper, do not hesitate to send your question in and it will be answered.—American Garage & Auto Dealer, 116 S. Michigan Ave., Chicago, Ill.

composition of electrolyte such as is used in all types of batteries, and how to prepare it.—W. F.—Wisc.

Answer: Electrolyte consists of a composition of pure sulphuric acid and distilled or other pure water, and is the solution used in all storage batteries. The battery will not work if the solution is too strong and must therefore be diluted with sufficient pure water to bring it to a specific gravity of 1.270 to 1.300 for a fully charged battery. Do not overlook the important fact that electrolyte stronger than this is injurious.

In preparing the electrolyte a glazed stone vessel or lead lined tank should be used, and water is the first ingredient to be put in. The next step is to fill a hydrometer syringe with chemically pure sulphuric acid and add to the water, being sure to hold the nozzle under the surface. The proportion of water should be about 3 3/4 parts to 1 part sulphuric acid, which

proportion will produce electrolyte of 1.250 specific gravity. The solution should be stirred with a glass rod or clean piece of wood. After this has been done, rinse the syringe and test the strength of the solution and if it is about 20 degrees Baum allow it to cool, when it will be stronger. If it is determined the solution is not strong enough more acid can be added; if too strong add water, but by all means do not allow the pure acid to remain in the syringe.

A most important factor in the preparation of electrolyte is that both water and acid should be **CHEMICALLY PURE**, which is the same standard of purity as is sold at drug stores as "CP" (chemically pure), or by manufacturers of chemicals, as "battery acid." At the same time do not confuse the meaning of "chemically pure" as necessarily "full strength."

Acid may be full strength and at the same time chemically pure, and if this chemically pure acid of full strength be mixed with chemically pure water the mixture would still be chemically pure but not full strength. On the other hand, if a small particle of some impurity be introduced into acid that is chemically pure, the strength would not be materially reduced, but it would be impure.

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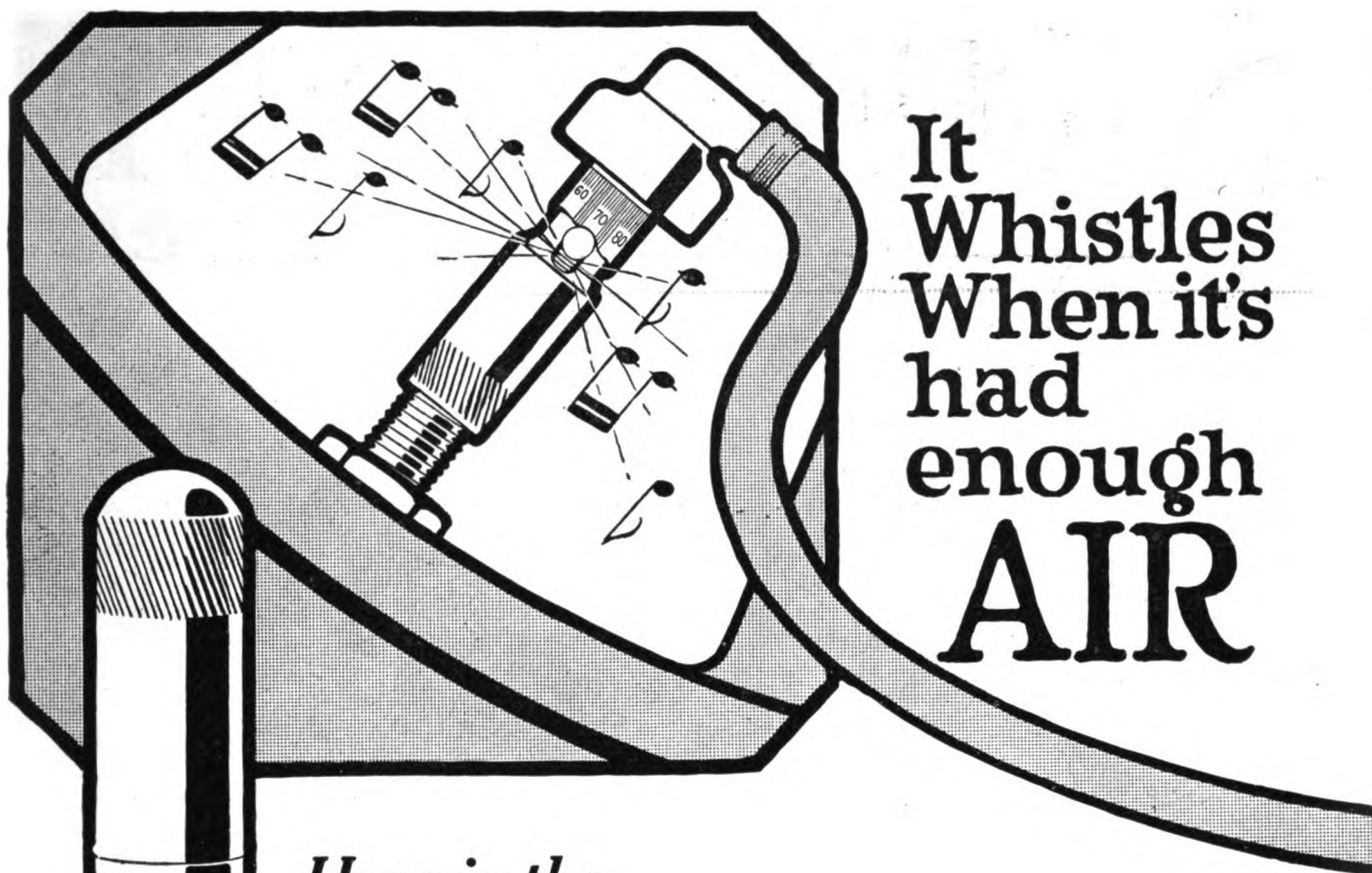
Racing Car Exhaust.

Question: I am overhauling in my shop a Ford car into a speedster type. The owner has requested me to make over the exhaust pipe so that it will produce a rumbling sound such as is made by a racer. I would appreciate very much should you find space in your next number for suggestions along this line.—C. B., Iowa.

Answer: The low rumble which is heard in the racing cars is generally due to the design and construction of the engine, and it is very difficult to produce the effect with a car such as the Ford. One reason for this is that the regulation racing car is equipped with a much larger exhaust pipe, different valve layout, a larger carburetor and no muffler whatever.

One method used to get this rumbling effect is to intensify the sound. You should be able to accomplish this with the aid of a large sheet steel cylinder constructed with a conical shaped head into which the exhaust pipe is led.

After this has been done then flare the end of the exhaust pipe, while the rear end of the cylinder should be covered with a metal cap containing several holes. In connection with this method it might be suggested that the thinner the exhaust pipe the better will be its radiating effect.



It
Whistles
When it's
had
enough
AIR

Here is the **Automatic Pressure Regulator**

The "Automatic Pressure Regulator" absolutely prevents over-inflation—the cause of most blow-outs and give-outs.

It is easy and simple to set the "Automatic Pressure Regulator" for just the right amount of air for a tire. When you get that much, a cheery little whistle announces "enough"! *You can't put any more in!*

Think how much this saves: It lengthens the life of tires 50% to 75%; it cuts down gasoline 15% to 20%; it saves time and mess, for you don't have to fool

with a pressure gauge; and it makes a much easier riding car with repair bills cut way down.

Isn't that a real, inspiring proposition? Every motorist ought to have four Automatic Pressure Regulators—one on each tire. Our dealers will get a volume of business that they hardly dared expect.

We're backing them strong with concentrated advertising and handsome dealer helps. *You can't afford to let this opportunity slip by.* Ask your jobber or write us for details *today—don't delay!*

THE AUTOMATIC SAFETY TIRE VALVE CORP.
1765 Broadway, New York City

*Here it is—
Just screw it on*



BIG MONEY

In Remiling Tires

EVERYWHERE tire repair men are awakening to the enormous money-making possibilities of remiling tires. No business today offers such guaranteed sure returns.

Formerly motorists had the choice of two alternatives: To run their tires on the carcass after the tread had worn off, with a blowout as a result, or, to depend on makeshift repairs that gave no assurance of sufficient wear to pay for the repair cost.

So for years motorists have been waiting for an answer to this problem—for a tire-remiler that would enable them to get 100 per cent value from their Tires.

Now that long-awaited-for tire-remiler is here. It is the final answer to the less-tire-cost-per-mile problem. It is the Miller Ad-On-A-Tire.

Every motor car owner, regardless of the make of tire he prefers, is a Miller Ad-On-A-Tire prospect. Some men prefer one make of tires—others another. But ALL realize that in the Miller Ad-On-A-Tire they have the tire-remiler that will make their old tires almost as good as new—**regardless of the make of tire they originally preferred.**

The result has been that Miller Ad-On-A-Tire dealers everywhere are making the most astonishing profits.

Stop a moment and compute the number of motor cars in your city. Each one will this season need from 4 to 6 Miller Ad-On-A-Tires.

Think what this means to you in Ad-On-A-Tire business! In new customers who will learn to know your store and have confidence in your work and what you sell! In more business and bigger profits all down the line!



Miller AD-ON

Write Today For Our Agency Offer

THE Ad-On-A-Tire is built by the Miller Rubber Company, makers of the famous Miller Uniform **Geared-to-the-Road** Tires.

The same uniform workmanship, finest quality materials, and efficient factory methods that have made possible Miller matchless tire uniformity have gone into the making of the Miller Ad-On-A-Tire.

With this tire-remiler motorists save 75 per cent of their tire value. Carefully kept records in hundreds of cases under the severest tests prove this.

The Miller Ad-On-A-Tire is built of tough, buoyant rubber. It has several layers of fabric-breaker strip, tread and side walls which completely cover the tire clinch under the rim. Once on, it becomes an integral part of the tire.

And the Ad-On-A-Tire also has the famous **Geared-to-the-Road** Tread that assures perfect traction and greater safety.

We give to our dealers a most complete agency proposition—attractive profits, and complete sales and advertising assistance, such as letter-heads, newspaper advertisements, folders, wall hangers, price lists, etc. In fact, everything that will enable you to get the full benefit from the wonderful Ad-On-A-Tire market is included. Absolutely no extra equipment is required.

Write us today for the detailed information. Each day's delay means lost business and profits. Don't let someone else get in ahead of you. The time to get busy is right NOW. So clip out the coupon and mail it to us. Remember, to get the facts obligates you in no way.

THE MILLER RUBBER COMPANY

Dept. A-193, Akron, Ohio

*Makers of Miller Uniform Tires and Tubes.
Also Miller Surgeons Grade Rubber
Goods, for Homes as well
as Hospitals.*



-A-TIRE

CLIP THIS COUPON NOW

THE
MILLER
RUBBER
COMPANY,
Dept. A-193,
Akron, Ohio

Gentlemen: Without any obligation on my part please send me full information regarding your Ad-On-A-Tire Agency Proposition.

Your Name

City..... State.....

I sell the following tires.....

I do only tire repair work.....

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

There can be found on the market several cut-outs so designed as to intensify the sound of the exhaust, and this may be as good a suggestion as we can offer.

In case you do not wish to use a muffler you might try this scheme: Rivet a funnel on the end of the exhaust pipe, and though the sound thus produced may not sound exactly like a full-fledged racing car, it does assist in intensifying it. The owner should not forget, however, that there are many communities through which he will pass, if much touring is contemplated, which will not tolerate automobile cut-outs or exaggerated exhaust sounds.

* * *

Oil for Bearings.

Question: Will you kindly suggest what you consider the best kind of oil that should be recommended for bearings?—M. W. V.—III.

Answer: We would suggest that in ball bearings that move with great rapidity ordinary lubricating oil is best to use, while on the other hand, for slow moving bearings semi-hard graphite grease will give the most satisfactory results.

* * *

Automobile Pullman.

Question: Will you be kind enough to publish in the next issue instructions for cutting down the back of front seat in such a way that it will fill the space between the front and rear seats and so can be used for a bed on touring trips? Suggest also the best method of bracing the back of the front seat when down in position for the bed, as well as in the raised position.—G. M. L., Ky.

Answer: The hinges found on the board that is underneath the front seat cushion should be removed and iron hooks placed on each end so that when they are hooked over the closed front doors the board will be in line with the seat cushions and provide ample length for a comfortable bed. The hooks should be lined with either leather or felt, thereby preventing the paint from becoming scratched, and when the board is replaced under the seat cushion it cannot rattle against the gasoline tank.

The proper place to saw the back can be determined by measuring down about fourteen inches, if a Ford, from the under side of wood upholstery strip of the back of the seat. Wrap the hacksaw blade with friction tape and run the teeth of the saw so that the cutting stroke will be towards rather than from you, and you will have no trouble in cutting the back.

Make a template of the seat edges and apply reinforcement strips. These strips should be of 1½-inch material. Pin hinges can be used in holding the back in position when up, and there should be no rattle or spread. A foot rest can be installed which can support the back when the bed is folded up.

To Tin Soldering Iron.

Question: Will you kindly advise in the columns of your paper whether or not a new soldering iron should be tinned, and if so, how should it be done?—J. T., Mich.

Answer: Yes, a new soldering iron must be tinned before it will hold the solder. This can be done by heating the head of the iron sufficiently to melt the solder quickly (filing the tip to the clean metal), then dip the point into the soldering liquid and apply to the soldering stick. You will observe that a small bit of the molten solder will stick to the tip, and this should be worked into the iron by some such way as chipping a hollow in a brick into which the iron can be rubbed.

In case the operator should overheat a soldering iron, the tinning is apt to be burned away and the iron will have to be again tinned. One should be very careful in using only enough heat on the iron to melt the solder, and further, use no more solder than is absolutely necessary, remembering that no additional strength is acquired through an excess amount of solder.

Another suggestion in line with this subject is that, while new work can be cleaned with an emery cloth sufficiently for solder to adhere, any greasy parts should first be dipped into hot water and soda so as to remove the grease, then with a brush apply the soldering fluid to the surface which is to be soldered.

* * *

Garage Press.

Question: I have been reading with interest the page of "Shop Kinks" published in the American Garage & Auto Dealer and it occurs to me that you may be in position to help me out. I find in the course of my work frequent demand for a press and am wondering if there is any method I could use to make one. Any suggestions will be appreciated.—A. M. C., Ohio.

Answer: A very simple method of constructing a press such as we would suppose could be used to a great extent in any repair shop, is to use a 14-inch structural steel I-beam as a foundation. Drill in each corner a 1¼-inch hole forming a 12-inch square; cut four steel bars about 2 feet long and thread them at each end. These bars are to be screwed into the four holes and set with nuts.

The next step is to drill similarly a 16-inch square castiron plate, about 1½ inches thick, and place over the tops of the bars. Through the center of this plate place a 2-inch screw the upper end of which should be squared so as to take a large wrench. This press should be strong enough to do any ordinary automobile work.

Still another press can be made by any repairman by using two steel I-beams about 16 inches wide and 3½ feet long. These beams should be held together by four 1-inch steel bars about 2 feet apart. In the center of the upper beam there should be a 1½-inch screw with the top end

squared, as in the first-mentioned press. This press should be even stronger than the other and capable of handling any sort of repair work required on an automobile.

* * *

Aluminum Pistons for Fords.

Question: I am rebuilding a Ford touring car into a racer and it has been suggested to me that I could get good results by substituting aluminum pistons for those of the regulation Ford motor. I would appreciate very much if you would publish in the American Garage and Auto Dealer just what, if any, the advantages of aluminum pistons may be, and any further suggestions you may be able to offer.—D. L. H., Penn.

Answer: It is claimed by some manufacturers that by reducing the weight of the reciprocating parts the vibration is lessened, thereby permitting quicker pick-up and higher engine speeds. When installing aluminum pistons ("lynite" pistons, as they are also called), bear in mind the fact that aluminum expands more rapidly than cast iron.

For this reason it will be necessary to fit the lynite pistons with greater clearance so as to keep them from sticking in the cylinders when the engine becomes hot. The clearance for average speeds should be .007 to .008 at skirt, and .014 to .016 at top; for racing, sixty to seventy miles per hour, .014 to .015 at skirt and .024 to .027 at top.

Another feature claimed for the lynite pistons is that inasmuch as aluminum conducts heat away more rapidly, less carbon will form on top of the pistons. It is further claimed that there is less friction between piston and cylinder walls, and that less wear is caused on the castiron cylinder walls.

Special piston rings are usually provided for use with aluminum pistons, so designed as to prevent the leakage of gases, thereby increasing power. It is also claimed that the extra clearance, when cold, will make the engine crank easier; on the other hand, unless carefully fitted, aluminum pistons are inclined to slap at low engine speeds, which will disappear, however, as soon as the engine shall have become heated sufficiently to expand the pistons to a more perfect fit.

* * *

Container for Soldering Acid.

As a rule soldering acid is in a common glass, which in a busy repair shop is easily tipped over, and being thus exposed is liable to be broken. A much better arrangement can be made from a wooden block the base of which should be a little larger than the top part, which makes it all the more impossible to upset. Into the top of this block drill out a hole of sufficient size into which can be sunk a glass jar for holding the soldering acid. A small hole can also be drilled into the top for holding the acid brush, handle down.

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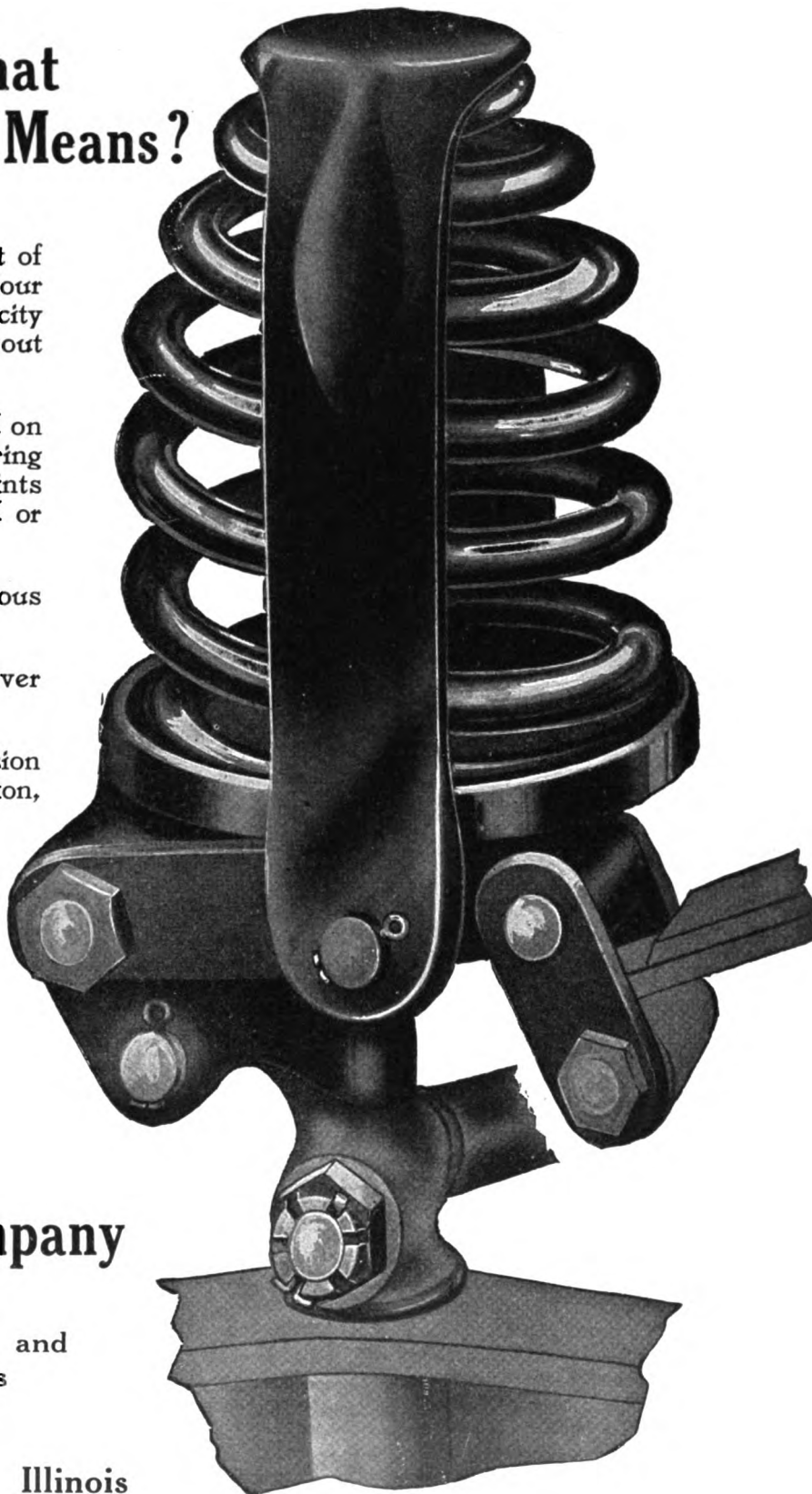
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Solutions for Mechanical Problems

By E. B. Hinrichsen

Oil Cups or Grease Cups?

Question: As an interested reader of your publication and a close follower of the mechanical hints which you give, I was extremely surprised to read your answer to the last question on page 40 of your June issue regarding the use of oil cups in place of grease cups. Your advice is all the more surprising because of the good judgment you use in answering various other inquiries.

The writer has been in the automobile business and driven cars of various makes for the past 15 years and also happens to have a fairly wide acquaintance among automobile manufacturers. I have yet to find one who is not thoroughly convinced that grease is the only satisfactory lubricant to be applied to friction bearing surfaces on a chassis of an automobile.

I quite agree with you that it is far easier to use the oil. I will go further and say that one might as well use the oil in the hopes of at least getting a little moisture around the bearing than attempt lubrication with the types of grease cup, which unfortunately the majority of manufacturers still supply.

However, there is on the market a method of obtaining positive grease lubrication of each and every kind of friction bearing surface. If you have not a personal acquaintance with this method of lubrication, I suggest that you lose no time in acquainting yourself with its merits.

The device to which I refer consists of a patented high pressure grease cup in which the grease is used in cartridge form. All that is necessary is to load the cup with one of the handy grease cartridges, snap on the cap (there are no threads), turn the plunger handle down and the grease goes right to the bearing under a tremendous pressure.

The grease can not go anywhere else because the cartridge is only open at the end, which of course is exhausted out through the nipple of the cup. When the cartridge is entirely exhausted, it is automatically extracted on the end of the plunger.

You will, I believe, agree that oil has not sufficient body to prevent the wear of two friction bearing surfaces in ordinary automobile service, and if, as I am inclined to believe, your reply was made because of the prevalent inefficient grease cups, I can assure you the method I have in mind, as described above, would more than restore your belief in, and advocacy of, grease as a proper automobile chassis lubricant.—H. W. M., Michigan.

* * *

Answer: I am afraid I did not express myself clearly in the article referred to. I

was taking convenience and cleanliness into consideration rather than the respective merits of oil and grease as lubricants. I believe the Scientific American of May 3, 1919, has the best article on this that I have seen. In part, it reads as follows:

"For some time past automobile designers have sought to provide some simple form of automatic lubrication system for the usually neglected parts of the car chassis, such as the spring bolts, brake connections, radius rod bolts, spring shackles and other out of the way parts.

"While oil is not an ideal lubricant for heavily loaded, slow moving bearing surfaces, it has the advantage over grease of being fed by capillary attraction, while grease needs pressure to force it to the bearings and if this pressure is not applied, the grease will not flow."

I think this bears out your contention in regard to the merits of grease for this purpose and will readily admit that there is nothing better when properly applied. Perhaps some more of our readers have some ideas on the subject.

* * *

Starting Difficulty.

Question: Why is it that my car is hard to start sometimes with the starter and is easy with the crank? I notice that if it does not start on the first turn or two that I have to hold down the starter button for a minute or so.

When this happens if I get out and turn it over with the crank, it usually goes right off. Some time ago I had the battery taken out and charged and for a while this trouble disappeared, but now it is back again. My car is a Briscoe.—Wm. B. O., Ind.

Answer: I assume your model of car is not equipped with a magneto but uses the battery through a coil and high tension distributor. It often happens that when a storage battery is low that with the starting motor thrown in, there is not enough current left for the ignition.

The starting motor is a heavy load for the battery at any time and when the battery is in a partially discharged condition, it practically requires the entire output to operate the starting motor only. If this trouble is annoying enough to justify a little expense in overcoming it, you can install a set of dry cells for ignition when starting.

If the car is not equipped for dry cells, it will be necessary to install a new ignition switch and some wiring. I will send you a wiring diagram if you want it. If you do not wish to do this, it will be necessary for you to keep the battery well charged.

* * *

Car Slows Down.

Question: I have driven a Velie for

two years without any trouble. I know nothing about a car and am afraid to take it to a garage without being able to tell them just what I want done as several of my friends have cautioned me against doing so.

In just the past few days I find that I cannot go faster than 20 miles per hour. The engine seems to start easily and runs well up to that speed and a little beyond it for a short time. Then it begins to die down and 20 miles per hour is the best I can do.

I am wondering if you can give me any advice so I will know what to tell the mechanic to do when I take it to the garage.—J. S. H., Ills.

Answer: From your description, I am of the opinion that you have a partial stoppage in your gasoline feed pipe. A partially stopped flow will produce the condition you describe. To overcome it, the pipe must be disconnected and cleaned out, the strainers in the gas tank and carburetor cleaned and all piping or other devices through which gasoline is carried thoroughly cleaned out.

Don't think because your friends knock garages that there are no good ones. I know of one in your locality and am sending you their address by mail. Suppose you try them once and see if you don't get your money's worth. You won't get something for nothing but I believe you will get value received.

* * *

Engine Misses When Accelerated Quickly.

Question: I drive a Lexington Six. The other day I did a few things around the car and since then I have had trouble. I only did three things. I drained the oil out of the crank case and put in new oil. I jacked up the body of the car and worked oil between the spring leaves. I examined the distributor and found that the spring on the arm that makes contact with the center point was nearly broken off. I drilled a hole in the arm and put a screw through to hold a new spring.

When I tried to use the car again I found that it would start and run all right until I tried to speed up. Then the engine would miss for a while and finally get to running good. I tried it out several ways and found that if I increased my speed gradually it would not miss but if I tried to increase suddenly I would get the missing until the car picked up its speed.

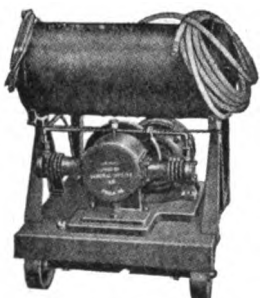
I thought at first that my work on the distributor might have caused it but don't see how it could. The head of the screw I put in does not touch any other part of the car. The closest it comes is about one-eighth of an inch.—A. Z., Ill.

Answer: If nothing else has been changed, I think your work on the dis-

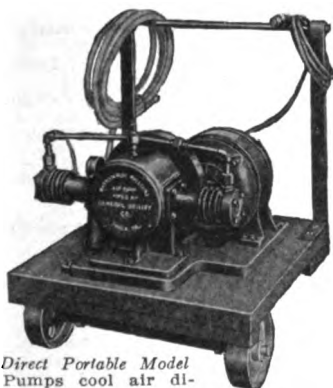
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Our 2-cylinder General Air Compressors are built to give trouble-free, low cost service. They are designed for efficiency and built with care. They have proved their worth in eight years of daily service in the hands of innumerable users throughout the United States.

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tributor is responsible. When you open the throttle suddenly you create a high resistance between the electrodes of the spark plugs. Electricity will always follow the path of the least resistance and in a case of this kind the path between the points of the sparkplugs is of a higher resistance than the air gap between the screw head and the arm of the commutator. Suppose you put on a new distributor arm and observe results.

Denby Truck Does Stunts During Big Tractor Test.

Tractor demonstrations have become more or less commonplace. There are not only the great national demonstrations every year, but practically every locality has during the course of the year a demonstration under the auspices of the dealers. It is seldom that anything out of the ordinary develops at one.

This was not true, however, of the recent demonstration at Sacramento, Calif. The Sacramento demonstration is always an im-

any truck can do and then some. So he proceeded to treat the dealers and ranchers to something new in farm work. He loaded the Denby with a capacity load of sand bags, then hitched on a 4-bottom standard tractor plow and proceeded to go on the field in competition with the biggest tractors.

He was not satisfied with this, however, and he made the test still harder by substituting for the plow a double disc-harrow and disked the part of the field he had already plowed. For this operation he had to pull the heavy harrow over the loose ground he had previously plowed. What he would have attempted next we are unable to say, because on protest of the other truck dealers the Denby was barred from the field thereafter.

This proved one of the greatest demonstrations of pulling power ever staged by a truck. It was particularly noteworthy to the ranchers and farmers who attended the demonstration, because of their knowledge that only a small percentage of the farm

ler, 134 Sixth street; Des Moines, C. O. Hart, Sears Automobile Co.; Davenport, C. E. Alford, Overland-Davenport Auto Co.; Dubuque, L. A. Walch, 950 Clay street; Fort Dodge, W. D. Tremain, Tremain & Rankin Auto Co.; Marshalltown, George Darling, G. W. Darling Co.; Oskaloosa, E. G. Walton, Walton Auto Co.; Sioux City, C. O. Cummins, O'Connell-Cummins Co.; Waterloo, O. A. Repass, Repass Auto Co.; Mason City, E. H. Wagner, Wagner Auto Co.

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(Continued from page 47
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VIRGINIA
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Denby Truck Does Tractor Stunt by Hauling Big Harrow Over Ground It Had Previously Plowed with a Four-Bottom Standard Tractor Plow.

portant one in California, because of the tractor factories there and the fact that some of the earliest development work in the industry was done in the Sacramento Valley. This demonstration has been held for years, but patrons were treated this year to a new "stunt" in farm work.

There were several trucks shown in connection with the tractors at this demonstration, and some of the demonstrators were driving their chassis over the plowed over ground to show their pulling power. Even this was somewhat of a surprise, as only a few years ago any truck would have become hopelessly mired in the loose, plowed ground.

J. I. Boldman, district manager of the Denby Motor Truck Company for the southern half of the Western states, was at this demonstration. He was assisting the Denby dealer, the Sacramento Valley Tractor Company, and they had at this demonstration a model 27, four-ton chassis.

Mr. Boldman has a well defined belief that a Denby truck can do anything that

tractors built today will handle a 4-bottom plow. In fact, the great majority will handle only 2-bottoms.

Iowa Dealers Organize Motor Trades Bureau.

Dealers of Iowa recently formed an association to look after the interests of men engaged in the retail automotive business in that state. The name selected for the new organization is the Iowa Motor Trades Bureau, and the headquarters are at Des Moines, Iowa.

Officers have been elected as follows: President, John Rude, Rude Auto Co., Marshalltown; Vice President, John Hanson, Overland-Hanson Co., Waterloo; Secretary, A. J. Knapp, Iowa Motor Trades Bureau, Des Moines; Treasurer, R. J. Clemens, Clemens Auto Co., Des Moines.

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Kansas City Automobile Sup. Co., Kansas City.
Missouri Auto Specialty Co., St. Louis.
Ozark Motor & Supply Co., Springfield.
Robison Heavy Hardware Co., St. Joseph.
Ross-Frazier Iron Co., St. Joseph.
Shanleigh Hardware Co., St. Louis.
J. B. Sickles Saddlery Co., St. Louis.
Simmons Hardware Co., St. Louis.
Sligo Iron Store Co., St. Louis.
Tooley-Campbell Dry Goods Co., St. Joseph.
Townley Metal & Hardware Co., Kansas City.
Wesco Supply Co., St. Louis.

MONTANA
Northwestern Auto Supply Co., Billings.

NEBRASKA
Henkle & Joyce Hardware Co., Lincoln.
The Kormsmeier Co., Lincoln.
Kopac Brothers, Omaha.
Lee-Coit-Andreesen Hdw. Co., Omaha.
Master Sales Co., Omaha.
McGraw Co., Omaha.
Mid-West Electric Co., Omaha.
Nebraska Buick Automobile Co., Lincoln.
Omaha Baum Iron Store, Inc., Omaha.
Omaha Rubber Co., Omaha.
Paxton & Gallagher Co., Omaha.
Sunderland Machinery & Sup. Co., Omaha.
U. S. Auto Supply Co., Omaha.
U. S. Rubber Co., Omaha.
Western Automobile Supply Co., Omaha.

(Continued on Page 46)

CHICAGO SOLDER CO., Chicago, U. S. A.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Facts and Ideas in the Tire World

Tire Repairer Does Big Business in Small Canadian Town.

That the size of the city or town in which a man is located has little bearing on the amount of business that can be done has been proved by D. W. Morden of Pilot Mound, Manitoba, Canada. His home town had but 407 inhabitants, according to the census taken in 1916, yet he handled \$1,800 worth of tire repair work in his first six months.

Mr. Morden was so pleased with what he had been able to do after having learned how to repair tires in the school maintained by the Haywood Tire and Equipment Co. at Indianapolis that he wrote to the concert about it. His letter, which was printed and illustrated in the Haywood concern's paper, *The Haywood Traveler*, reads as follows:



D. W. Morden in Front of Shop Where He Handled \$1,800 Worth of Tire Repairs in Six Months, Doing Most of the Work Himself Because of the Scarcity of Labor.

"In the last copy of the *Traveler* I noticed you are giving a prize for a writeup of us boys, so I am giving you below an exact and true statement of my 1918 business, which you can use any way you choose. I am also sending a photo of my shop under separate cover.

"During the month of February, 1918, I decided to go into the tire repair business. After careful consideration I finally made up my mind that I would go down to Indianapolis and learn the trade at Haywoods, which I did. I can truthfully say this was the best money I ever spent, for the knowledge I gained there in some 15 days saved me many a spoiled tire, a lot of valuable time, and heaps of study and worry, when I got into business for myself. Haywoods know the tire repair business from 'A to Z,' and aren't afraid to teach it to any one wanting to learn. If you don't learn it thoroughly, well, it isn't Oldham's fault.

"I came back to Canada and started up a shop in my own town on April 1, 1918, and

kept it open until November 1, 1918, just six months. You know this is cold country up here and no cars usually run much after November 1, until around April 1. So vulcanizing in a country town is not much good in the winter months. During the six months I find my books show the following results:

| | |
|---------------------------------|------------|
| Amount of tire repair work done | |
| and cash received for same..... | \$1,747.02 |
| Finished work, undelivered..... | 12.00 |
| Outstanding accounts | 41.25 |

Actual amount of work done. \$1,800.27

"I also have a stock of \$100.00 worth of rubber paid for to start on this spring.

"I have done all the work myself, except one man for eight days, and my brother a part of each day. I also performed my

duties as County Court Clerk, Secretary of the School Board, did practically all of the fire insurance of the town and several other private business transactions.

"I usually went to work at seven o'clock in the morning and quit at six o'clock. I handled my office business in the evening, so I was hustling, as the old saying is, from morning to night. I had to do it to keep up with the work; there was no other alternative. I pay \$5.00 a month rent for my shop and never spent one cent in advertising. I could hardly do the work that came in without advertising, and a man had to beg like a cripple to get any help out here last year.

"I expect business to be equally as good this summer as last, and have 25 tires ahead of me right now.

"I hope you will pardon me for writing such a long epistle, and in closing I only wish the Haywood Tire and Equipment Co. every success, as they sure put me on a good live line."

Wheat Men to Buy Many Tires, Predicts Rubber Man.

Among the many factors that point to the biggest automobile and tire year in the history of the motor car industry is the record breaking winter wheat crop in such states as Pennsylvania, Ohio, Indiana, Illinois, Missouri, Nebraska, Kansas, and Oklahoma, in the opinion of some of Akron's leading tire men. With this year's harvest at the government price of \$2.26 a bushel amounting to at least \$2,034,000,000 they declare that the strain on tire manufacturing resources will be acute, to express it mildly.

F. C. Millhoff, general sales manager of The Miller Rubber Co., manufacturing tires and druggists' sundries, recently returned from an extensive tour throughout the West. He declares that he has never before seen so much activity among the Miller dealers. "It isn't a question of selling them more tires—it is a question of keeping them stocked up," he declares.

"Although the grain has not been harvested, the farmers are so certain of the bountiful months ahead that, with the backing of their banks, they are spending money on improvements in the way of buildings, equipment, etc., on an unprecedented scale," he continued. "When this situation prevails it means an enormous demand for motor cars because the motor car is now an essential part of the equipment on every farm. Obviously, the buying and using of automobiles necessitates the purchase of tires—that is where Akron cashes in.

"This optimistic spirit in the rural districts, from a financial standpoint, is not to be wondered at. Look at Oklahoma with her estimated yield of 54,134,000 bushels of winter wheat; Kansas with 197,339,000 bushels; Nebraska with 70,700,000; Missouri with 72,423,000; Illinois with 65,990,000, and so on. In practically all of the states it is the largest acreage on record, with the loss from winter killing, overflows and other causes extremely low—1.1 per cent.

"Likewise the production of hay is forecast at 114,930,000 tons, compared with 89,833,000 tons last year. In fact, it is going to be a big production year in almost every respect and big production years under conditions that exist today, will necessarily result in big business."

Mr. Millhoff also told about the growing Western demand for the big heavy duty pneumatic tires. "All of the Miller branches and distributors would take more of them, if we could get our production high enough," he said. "Less than 12 months ago we began sending a few of the 'sixes' and 'sevens' out to the branches for experimental purposes.

"The owners of large fleets of commercial vehicles were invited to try out one or

SHALER

5 MINUTE GARAGE VULCANIZER



Complete Outfit \$7

Free Patches Enough to Pay for It

To quickly introduce this wonderful new Shaler Garage Vulcanizer—we will send *Absolutely Free*, with each outfit—an assorted supply of Shaler Patch-&-Heat Units, that will make repairs enough to more than pay for the outfit.

This new gang vulcanizer was designed especially to meet the demand from Garages and Repair Shops for a large capacity, quick action, dependable vulcanizer, that uses the convenient Shaler Patch-&-Heat Units. These handy units are very popular for making tube repairs. Over 10,000,000 punctures were repaired with them last year. No other method is so quick, safe, convenient and satisfactory.

Makes 4 Repairs in 5 Minutes

You can obtain garage size, Large Packages of Shaler Patch-&-Heat Units from your jobber, at prices so low as to make this the cheapest method of vulcanizing. There is no danger—no gasoline, no blaze, no flame, no trouble, no waiting to heat vulcanizer.

Prompt Shipment If You Order NOW

For months our factory was unable to keep up with the big demand for this wonderful vulcanizer. We have now enlarged our factory and increased its capacity—and can promise prompt shipment—provided you order at once.

Write Quick—or Ask Your Jobber

Our low List Price \$10 is subject to 30% trade discount, making the Net Price to you only \$7—and with the outfit we will send you Free Patches enough to more than pay for it, so that the outfit costs you practically nothing.

C. A. Shaler Company, 366 Fourth Street, Waupun, Wis.

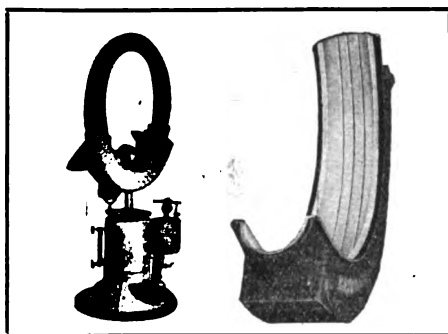


more of them on their cars. As a rule, those who tried them out, wanted more and almost before we knew it our production was growing rapidly. We are adding new equipment all the time for the building of 'eights' as well as 'sixes' and 'sevens' and we hope to be able before long to answer all demands."

Silvur Lined Retread Mold Made by Haywood Firm.

A new retread mold for tire repair shops is being marketed by the Haywood Tire and Equipment Co., which claims that it will turn out perfect retreading jobs. M. Haywood, president of the concern, has been experimenting for 11 years in efforts to produce a device that would accomplish tire repairs by the dry cure process. The new device, which Mr. Haywood calls the Silvur lined mold, is the result of more than a year's constant experimenting and development work.

In 1908 Mr. Haywood first conceived the idea of constructing retreading vulcanizers, where the live steam would be confined to the interior of the molds and not come into direct contact with the rubber and fabric of the casing. His experiments were successful and the Haywood retreading molds were placed on the market. The Haywood molds are hollow, allowing steam circulation from one end to the other, and heat the tire only to the termination of the tread.



Haywood Retreader and New Silvur Lined Mold.

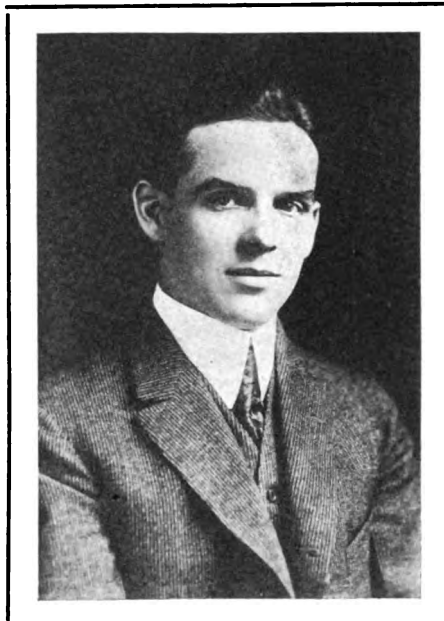
The molds vary from 35 to 37 inches in length, depending upon the size of the cross section. One-third of the tread is vulcanized at a time, requiring only three shifts to complete the operation. The molds that build ribbed tires have proved very interesting to the men who go to the Haywood plant to learn tire repairing in the school the concern maintains.

The Silvur lined retread mold is made of white metal, die cast, and is said to be absolutely free from blemishes. One of its features is that it is as smooth as glass and the heat travels through the composition metal faster than it will through grey iron. At each end of the Silvur lined retread vulcanizers there is a two inch cooling flange, permitting a gradual tapering off of heat and pressure.

Justin R. Weddell Is Advertising Chief for Firestone Tires.

Justin R. Weddell has been appointed advertising manager of the Firestone Tire & Rubber Co., Akron, Ohio. He came from the Corday & Gross Company of Cleveland, where he was sales manager.

Mr. Weddell's acquaintance with national advertisers dates from his entry into the business more than ten years ago in one of the large advertising agencies in



Firestone Advertising Campaigns Are Now Supervised by Justin R. Weddell.

Chicago. After serving an apprenticeship in that field he entered the organization of the Barnes-Crosby Engraving Co. of Chicago. A year later he was made branch manager of the Cleveland office of the company. He developed the service side of the business by adding to his staff trained artists and copy men. This led to his establishing a business of his own, the Weddell-Schmidt Company of Cleveland.

As an outcome of this development, Mr. Weddell and a large part of his organization were taken over by the Corday and Gross Company in what amounted virtually to an amalgamation of the two concerns. Here his abilities as an organizer and developer of new business were given full play. He was shortly appointed sales manager, which post he has held for the last three years. Mr. Weddell is a graduate of New Mexico State College and Denison University.

Long-Wear Rubber Co. to Sell Quality Casings and Tubes.

The Long-Wear Rubber Co., of Elyria, Ohio, has taken over the entire production and sales of the Quality Tire & Rubber Co., of Anderson, Ind., makers of Quality cord and fabric tires. This adds a daily capacity of 2,000 casings and 2,000 tubes to the Long-Wear production, which is now several hundred per day in Elyria,

and will shortly be increased by a substantial addition to the Elyria plant.

Both factories will be under the personal supervision of Frank W. O'Brien, general manager, with headquarters at Elyria. Plans of expansion now under way contemplate a total daily production of 20,000 pneumatic and solid tires and the manufacture of boots and shoes and general rubber goods.

Shaler Makes Gang Vulcanizer for Repair Shops.

Owners of garages and repair shops have keenly realized the need of a simple outfit for repairing inner tubes that is quick in operation, safe and convenient to use.

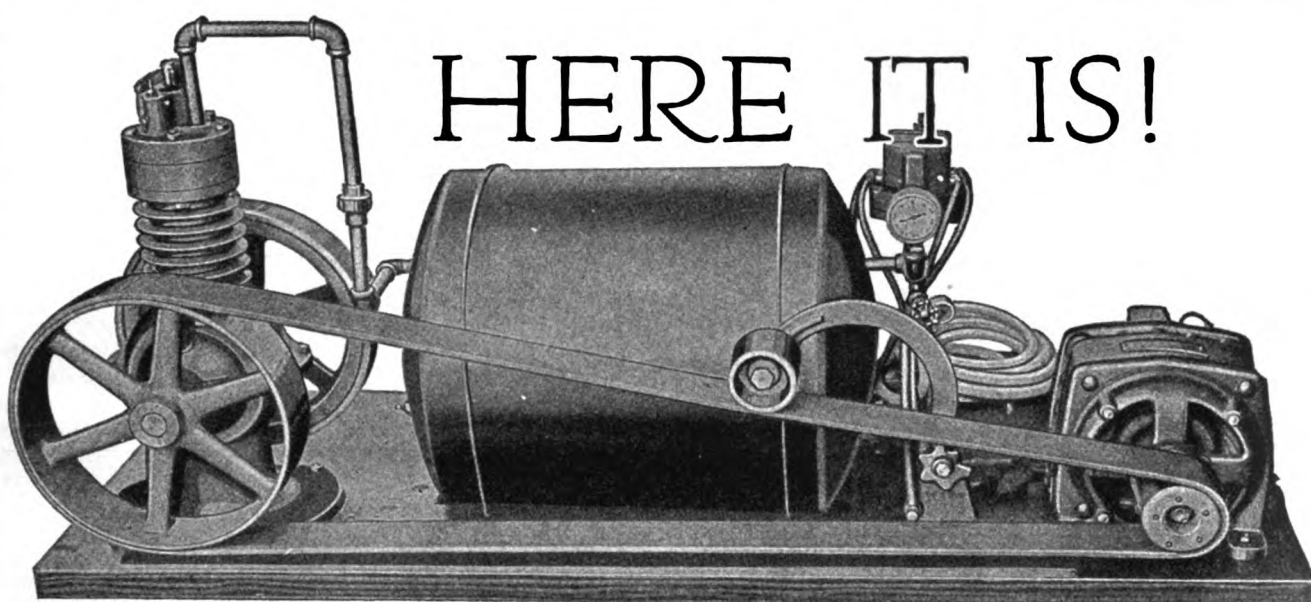
Gasolene vulcanizers which produce an exposed blaze from the burning of loose liquid are very objectionable because there is constant danger from the exposed blaze, and the liability of spilling flaming fuel on the tube itself and ruining it. Such vulcanizers have been used simply because nothing better had been invented, but the results have not been satisfactory, either to repairmen or motorists.

When the small, portable, solid-fuel vulcanizers were introduced, many repairmen adopted them in preference to the dangerous and unsatisfactory gasolene vulcanizers. These automatically make excellent, vulcanized tube repairs, without flame or blaze, in a few minutes. They compared this quick, simple, positive method of repairing tubes with the former slow, dangerous method that always presented the danger of spilling blazing liquid and ruining the tube, if not destroying the entire shop.

But these small solid-fuel vulcanizers did not have large enough capacity for the average repair shop. It is true that they do good work, do not require experienced help, and are automatic in operation, but tire repair shops needed a larger outfit—that had all of the advantages of these small solid-fuel vulcanizers and could repair more than one tube at a time.

A new gang vulcanizer for repair shops has been recently invented and put on the market by the C. A. Shaler Co., of Wau-pun, Wisconsin. It is designed to meet this demand for a tube vulcanizer of large capacity, that is simple in operation, and equipped to use the convenient patch-and-heat units that are so popular that over ten million tube repairs have been made with them during the past year.

This simple outfit is not portable, but is attached to the wall and does not take up much room. It vulcanizes four tubes at one time, in only five minutes, and makes a tough, lasting, feather-edge repair that cannot be torn off without tearing the tube. The complete outfit is inexpensive compared to the value of the work it turns out and the special garage size packages of patch-and-heat units are so reasonable in price as to make this one of the cheapest methods of making permanent tube repairs.



A Compressor of Real Capacity.

BIG capacity at high pressure is what you must have in a garage compressor these days. Big Cord Tires used on trucks demand it.

This No. 6 Au-To Air Compressor will stand the gaff of long working under full load.

All Au-To Air Compressors make good—we see that they do.

There are thousands in use in every part of the country—and we have never charged a cent for repairs on any of them.

The outfit has an unloader for easy starting and an automatic cut-out that keeps the pressure at a constant level.

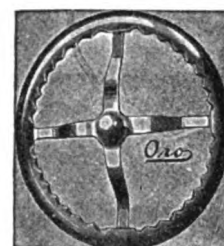
Every unit is made of material of the highest grade. The workmanship is accurate.

The compressor outfit is reliable—always running. It compresses $6\frac{1}{2}$ feet of free air per minute and is cut out at 150 pounds pressure.

Ask your Jobber or write us.

THE AU-TO COMPRESSOR COMPANY
WILMINGTON, OHIO

Oro
GOOD AS GOLD



Oro Steering Wheels for Ford Cars are seventeen inches in diameter instead of 15 which is the size of the wheel with which the car is originally equipped. They may be had either with or without the tilting feature, the latter making it possible to push the steering wheel up into the plane of the steering column so it is easier for a large driver to leave the car. The rim of the wheel is genuine high quality walnut wood; also furnished in imitation at a less price, highly finished. Spiders in malleable iron baked enamel finish or solid aluminum highly polished. Each one packed in individual carton.



Oro Combination Spark Plug and Cylinder Head Bolt Wrenches for Ford Cars fit the Champion 'X' plugs with which the car is equipped. The socket at the other end fits the cap screws in the cylinder head of the Ford Motor. This wrench is made of the best quality high carbon drop forged steel, hardened, and is practically unbreakable. The Ford Motor Company makes a similar wrench known as No. 2335.

Accessories — They Bring in Money

Here Are Presented Practical Ideas, Suggestions and Merchandising Plans, All Relating to Automotive Equipment Which Energetic Dealers Can Adapt to the Profitable Conduct of the Accessory Branches of Their Business

Duracord Lamp Cord Designed for Strenuous Service.

A new kind of portable electric hand lamp especially suitable for knock-about garage usage has just been put on the market. This extension lamp is the Duracord, and is notable for the cord with which it is equipped.

The cord is woven like high pressure fire hose from thick, heavy strands. Its texture is so tough that it can be pulled around corners, over sharp projections, dragged through oil and water, and even walked on with no more injury than ordinary wear and tear.

Ordinary cable coverings are braided instead of woven, and have a surface easily stretched or raveled. Steel armored cable has the necessary strength but there is the possibility of the metal covering cutting through to the electric wires when the cord is kinked or broken. This causes a short circuit or allows a dangerous current to run through the entire covering.

Duracord is declared to successfully overcome the disadvantages of other cords. Its worth has been proved in use on portable tools in big manufacturing plants, ship yards, and mines where in the hardest sort of use it has been found to outwear other cords from four to six times.

An added feature of the Duracord lamp is that the 20-foot cord is held in the handle by a patented fitting which takes all strain from the terminals and prevents the wires from pulling loose. The lamp is furnished completely wired in three styles.

White Products Company Brings Out New Display Card.

The White Products Company of Chicago is adding a number of new items to its line of automobile accessories. All of them will be marked and advertised under



New Display Card for Dealers Who Sell Auto Scope Windshield Wiper.

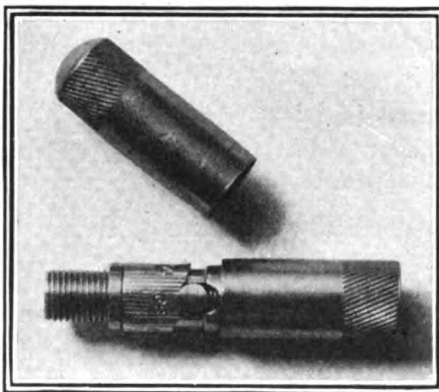
the trade name of White Line automobile accessories.

The White inside hood latch is standard equipment on quite a number of the better cars. One of the new items is a jack truck for garagemen. This truck slips under the rear axle of the Ford and instantly raises the car for repair work. Also a car can be readily drawn around any part of the garage.

A very handsome display card is being sent out to the trade on the Auto-Scope windshield wiper, another White Line product. This card is made either to stand up or hang up. Any dealer who has not received one can obtain a card by writing to the White Products Co., 100 West Jackson boulevard, Chicago, mentioning the American Garage & Auto Dealer.

Air Pressure Regulator Replaces Dust Cap on Tires.

An automatic pressure regulator for automobile tires, by which an exact and even pressure can be maintained, has just been put on the market. It is manufactured by



Automatic Regulator for Keeping Even Inflation in Tires.

the Automatic Safety Tire Valve Corporation, 1765 Broadway, New York City.

The new device is welcomed as the invention that solves the problem of fixed tire pressure, so essential to economical operation of the car but heretofore so hard to accomplish. The ordinary tire gauge is bothersome to use regularly. Rocking the car or kicking the tires to determine the air pressure is unreliable and often starts a break in the tire fabric.

The new automatic pressure regulator is permanently attached to each tire valve in place of the dust cap and adjusted by means of a movable collar calibrated to read pounds of pressure. When the tires are inflated the regulator automatically shuts off the air when the set pressure is reached, at the same time giving warning by a distinctive whistling sound, caused by

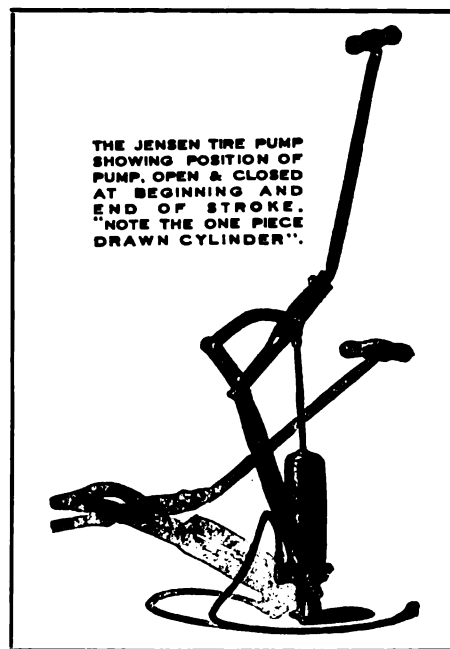
the excess air escaping through a port in the side of the regulator.

In construction the automatic pressure regulator is much like an ordinary tire gauge. The movable collar around the top, with which it is set for any desired pressure, controls a ball and spring valve inside which will admit no air after the set pressure is reached. The excess air, whistling through the escape port, gives audible evidence that the pressure is correct.

After the regulator is attached and set it needs no further attention. To inflate a tire the air hose is connected in the usual manner.

New Jensen Tire Pump Now Has One-Piece Drawn Cylinder.

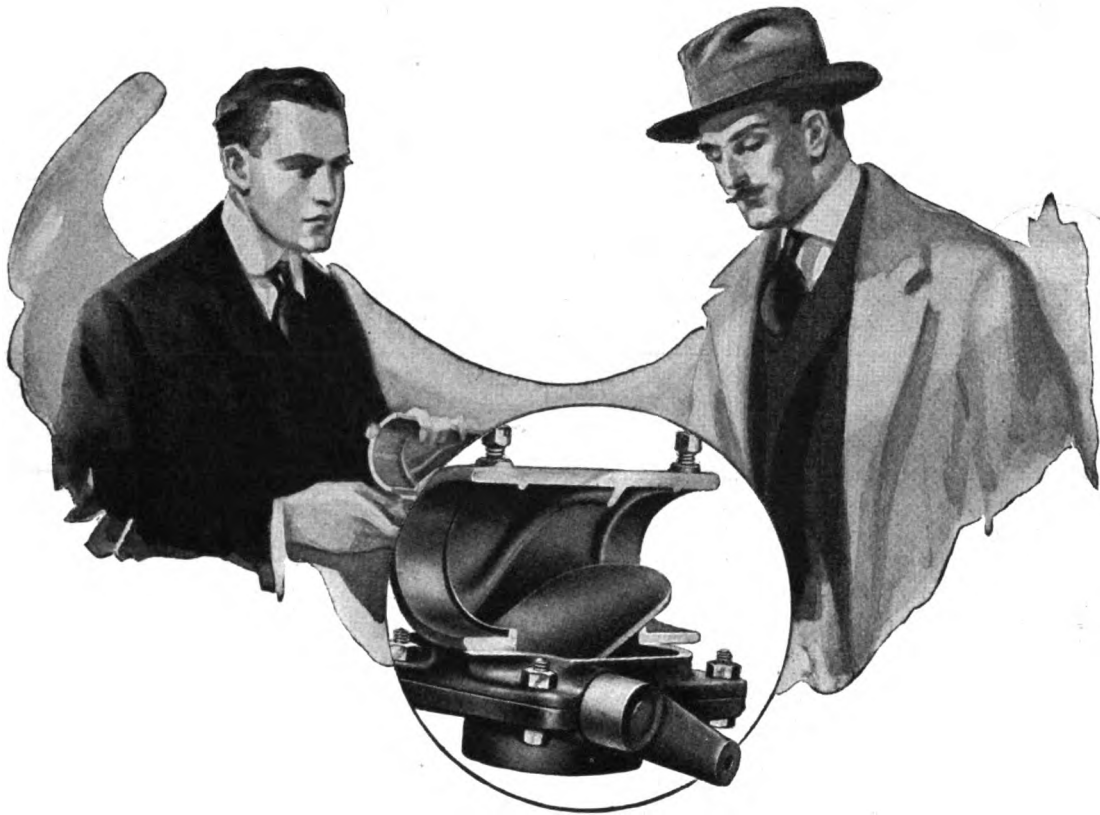
After extended experiments the W. H. Howell Company has finally produced a one-piece drawn cylinder for the new Jen-



Jensen Tire Pump.

sen tire pump. This improvement assures air tight compression.

Tests are said to have shown that the Jensen pump produces 90 pounds pressure with a quarter of the effort necessary when an ordinary vertical pump is used, and the task was completed in half the time required with the old style pump. The concern has not made any extra charge for the improved cylinder. Full details and trade prices can be obtained by writing to the W. H. Howell Co., 10 State street, Geneva, Ill., mentioning the American Garage & Auto Dealer.



“Nip trouble in the bud”

Keep your motor fit

DON'T overlook the little engine troubles. They soon develop into big ones. Know what your engine is doing, and it is easy to keep it fit.

There is one sure way of telling at once whether you are getting the most out of your engine. That is with a G-Piel Cut-Out.

A G-Piel Muffler Cut-Out enables you to tell in a second when you are wasting power,

gas and money. It makes for economy.

When you step on the G-Piel Muffler Cut-Out you literally *blow* the carbon right out of your engine. The exhaust is cleaned and carbon accumulations are forced out of the manifold. It eliminates back pressure.

Sales Department

EDWARD A. CASSIDY CO., Inc.
Madison Ave. at 40th St., New York City
Manufacturers: THE G. PIEL CO., Inc.

The G-Piel Muffler Cut-Out

PIEL PRODUCT

“Tells the motor's secrets”

Attractive Display Stand for Boyce Motometers.

O. R. Smith, advertising manager of the Moto Meter Co., Inc., announces that the concern has a very attractive mahogany display stand. The stand is 19x11½



Counter Display That Shows Boyce Motometers for Dealers

inches and has a receptacle on the back to hold advertising matter for the Boyce motometers.

The stand is printed in colors to show the instruments exactly as they are. Any accessory jobber, dealer or garage man will have one of these display stands furnished to him free of charge upon placing a small order for Boyce motometers.

Full particulars can be obtained by writing to the Moto Meter Co., Inc., Long Island City, New York, and mentioning the American Garage & Auto Dealer.

Liberty Sparkplugs Announced to the Trade.

After a long period of development the Casey Hudson Co. has started quantity production on the Liberty sparkplugs. The concern has been specializing in the making of automobile parts and during the war made some of every screw machine part that went into the Liberty motor—nearly 150 of them.

Without being freaky or extreme in any way, Liberty sparkplugs are said to deliver a hotter, more penetrating spark, largely due to an improved and patented spark gap intensifier. This intensifier is built right into the porcelain assembly where it cannot come out of adjustment or cause trouble. The gap is perfectly adjusted for giving the proper intensifying of the electric current. It is neither too great to throw strain on the ignition system or too small to get the proper intensity into the spark.

It is claimed that Liberty sparkplugs make starting easier and stop missing and skipping caused by compression, killing the spark in the cylinder. Also they will fire in carbon and oil where other plugs foul out in a short time.

Liberty sparkplugs are sold in rather a unique way. They are packed four or six to the box instead of separately, as is usually the case. Full information can be secured by writing Casey Hudson Co., 361 East Ohio street, Chicago, Ill., mentioning the American Garage & Auto Dealer.

Ingenious Display Card Shows Bottle of Waxit.

The Waxit Manufacturing Co. of Plymouth Bldg., Minneapolis, is providing its dealers with a very attractive and prac-



New Waxit Display Card.

tical window or counter card. In the center a bottle shape space is cut out so that an actual 14 oz. bottle of the polish can be put on display.

The background of the card is a fine representation of American walnut with the letters in yellow. Scant justice is done by the black and white picture shown on this page. The Waxit Manufacturing Co. will gladly send a sample package of this product to any dealer and advise how they can get this display card. Also any car owner can get sample bottle of Waxit by mentioning the American Garage & Auto Dealer and enclosing 10 cents.

To Prolong Gasket Life.

No doubt every repairman realizes the various troubles arising from short lived gaskets. It may not be generally known, however, that this trouble can be overcome by a very simple method, that is, by coating both sides of the gasket with steam cylinder oil. Then tighten the nuts gradually all around, run the motor without water in the cooling system, until it is real hot, and then tighten the nuts again.

It may be unnecessary to suggest, however, that in a case of this kind each nut should not be tightened fast, one at a time, but tighten each one partially, repeating this process several times until they are all tightened securely. This same method of tightening nuts can be applied to the tightening of tire rims, which makes them equally secure at any and all portions of the circumference.



Prize Winning Display in Window of Belcher & Loomis' Store in Providence, Showing Nokorode Solderkit and Other Nokorode Products. Accessory Dealers and Their Employees Are Invited to Arrange Similar Displays and Send Photographs of Them to Treasurer Frank Chapman of the M. W. Dunton Co. at Providence, Who Awards Prizes for Good Looking Windows that Feature the Nokorode Line of Specialties for the Retail Automotive Industry.

PASCO

Riding Comfort

Is far greater in a car equipped with PASCO WIRE WHEELS.

You get the full benefit of the elasticity yielded by each wire spoke.

This "springiness" eases the strain on the car-body. Jars and bumps lose most of their terrors.

Chassis repairs diminish. You obtain much higher mileage on tires and gas.

You enjoy more security, since a PASCO Wheel is at least 5 times stronger than a wood wheel, size for size.

Besides—you have the PASCO ingenious spoke-lacing, safety locking device, indestructible hub-cap, rust-proofing, complete curb clearance, and many other PASCO advantages.

Perhaps you begin to see why PASCO WIRE WHEELS are so strongly favored by car-owners and manufacturers who KNOW.

DEALERS: Write for our plan.

NATIONAL WIRE WHEEL WORKS, Inc.

GENERAL SALES OFFICES, DEPT. G
416-417 Book Bldg., DETROIT, MICH.

FACTORIES AT
Geneva, N. Y.
Hagerstown, Md.

Branches in
New York Chicago Detroit
Minneapolis Kansas City
San Francisco Seattle
Dallas Atlanta
IN CANADA: Northern Electric
Co., Ltd., Montreal

Truck Makers Converted by Trailers

Commercial Vehicle Producers Find Trailers and Semi-Trailers so Valuable That They Recommend Their Use in Various Lines of Work and Many of Them Manufacture Special Tractors for Hauling Them

By H. W. Perry

General Manager, Trailer Manufacturers' Association.

Many motor truck companies have been so thoroughly convinced, after investigation, of the advantages and economies of trailers and semi-trailers in various lines of business that they not only recommend their use, but are themselves manufacturing special tractors for hauling trailers.

Among the concerns offering such tractors as regular models are Pierce-Arrow, International Motor, Garford, Fulton, G. M. C., Locomobile, Sterling, Gramm-Bernstein, Indiana, Service, J. C. Wilson, Acme, Master, Armleder, Moreland, Koehler, Day-Elder, and Oneida. Other makers, including Kelly-Springfield, Lewis-Hall, Maccar and Dart, build tractors on special order.

In nearly all cases where the truck manufacturers do not build tractors they recommend the use of trailers with their

A considerable number of truck companies employ transportation engineers who have made a special study of all phases of haulage and whose duty it is to analyze the customer's requirements and recommend the particular equipment best suited to meet them.

By calling such experts into consultation the prospective purchaser of haulage equipment finds a solution for the most difficult transportation problems, and avoids costly mistakes such as the purchase of trucks that are too large, more trucks than are needed, trucks not well adapted to his needs, or trucks that would have to stand idle for several hours in the working day while loading or unloading.

As it is to the best interest of the truck manufacturer to deal honestly with the customer and sell only such equipment to

him as will give him the most satisfactory service, the transportation engineer recommends the use of tractors and trailers when his analysis of the requirements and operating conditions shows that they will be most efficient and economical.

The use of trailers enables the motor truck owner to greatly increase the capacity of his vehicle at a very slight additional expense and in many cases makes motor truck operation economical where

starting the semi-trailer with its load.

The fifth-wheel trailer provides the most economical and convenient means of transporting excessively long timbers, poles, pipes, stage scenery, derricks and so forth, or unusually heavy articles such as steam boilers and engines, structural beams, stone columns, etc.

When four-wheeled trailers are to be used with their regular truck models many manufacturers make certain changes in construction, such as strengthening the rear end of the frame, attaching a pintle hook or building in a spring draw-bar to connect the trailer, and reducing the gear ratios so the truck will travel at lower speed and have more pulling power. Other truck makers, however, have found that such changes are not necessary with their models.

Ohio Trailer Company Produces Two New Models.

With the announcement of two new models, the Ohio Trailer Co. now offers one of the most complete trailer lines produced by any manufacturer.

The two-wheel trailer line includes the 800-1,000-pound model; the 1,250-1,500-pound model and the new model rated at 1,500-2,000 pounds capacity, with stake panel body or with cattle-rack body.

The four-wheel trailers produced up to the present time have included a two-ton model, a three-ton model and a five-ton model. The 1,500-2,000-pound model just announced has either cattle-rack body or panel body.

The new four-wheel trailer known as model 100-B is of reversible type and is sold complete with either cattle-rack body or with panel body.

Three Companies Join Trailer Association.

During the past month three more trailer companies have joined the Trailer Manufacturers Association, which was organized last March and opened headquarters May 1 at 110 West 40th street, New York. They are the Southern Motor Manufacturing Association, of Houston, Texas; Wm. G. Hesse & Son Mfg. Co., of Leavenworth, Kansas, and the Los Angeles Trailer Co., of Los Angeles, Calif.

The association now has members in the following states: Massachusetts, New York, Pennsylvania, Ohio, Michigan, Wisconsin, Kansas, Texas, and California.



New Model Two-Wheeled Ohio Trailer.

regular short wheelbase truck models, wherever the character of the customer's haulage work and the conditions of the highways make it certain or probable that trailers can be used successfully.


The tractor trucks are designed especially for draft work, having very short wheelbase, extra strong frames, heavier axles, wheels and springs, larger tires, lower gear ratios and special built-in attachment devices for the trailers or semi-trailers.

The foregoing facts show that motor truck manufacturers now recognize the trailer as the newest development in economical and efficient haulage by highway and an important aid to them in selling transportation equipment to industrial and commercial concerns.

otherwise it might not compete successfully with haulage by team.

On good, hard roads with moderate grades, almost any good truck has sufficient excess or reserve power to haul, in addition to its own capacity load, a trailer with an equal load, or by the substitution of a fifth wheel for the truck body, to haul a load of double or triple its rated capacity with a semi-trailer or two-wheeled trailer. In the latter case, half the load is carried on the rear of the truck and the other half on the trailer wheels.

The fifth wheel is attached horizontally to the truck frame directly over the rear axle and supports the front end of a semi-trailer. It permits an up-and-down rocking motion and commonly is provided with springs to take up the shock of



*There's a Harvey
Jobber Near You*

Car-owners naturally
place more confidence
in dealers who handle
the Harvey Spring.

They have learned to
look for and insist upon
this trade-mark that
guarantees quality —

*Send to your jobber for the
Harvey Spring Book*

Harvey
RACINE

**Boltless
Automobile
Springs**

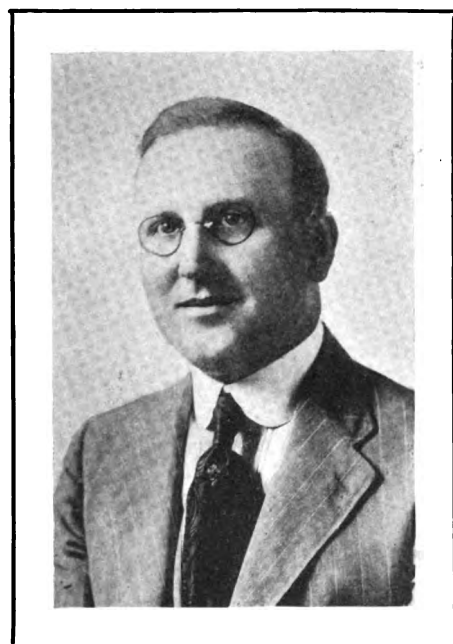
Easy Riding - Guaranteed

News of Manufacturers and Jobbers

Justice Is Pasco Sales Head and Opens Office in Detroit.

Announcement has been made by the National Wire Wheel Works, Inc., of the appointment of J. L. Justice as general sales manager. For the last three years he has been associated with the Maxwell Motor Co. of Detroit as zone supervisor. Mr. Justice has had many years of experience in the automotive field and has a wide acquaintance with automotive tradesmen throughout the United States.

In order to be in the heart of the automotive industry, the National Wire Wheel Works has established its general sales office in Detroit. Headquarters have been opened in the Book building so that Mr.



Pasco Sales Chief, J. L. Justice, Who Opens an Office at Detroit.

Justice and H. E. Van Horn, assistant general sales manager, may be in close touch with the large companies producing automobiles.

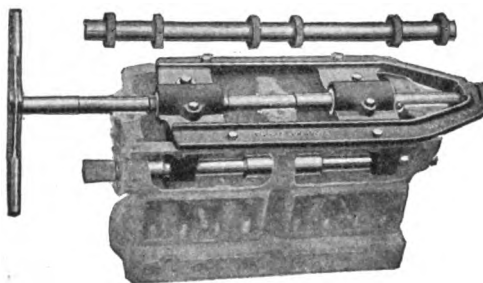
The National Wire Wheel Works recently opened a new plant at Hagerstown, Md., as the demand for Pasco wire wheels was so great that the original factory at Geneva, N. Y., could not keep up with orders. The Hagerstown plant is one of the largest wire wheel producing centers in the country and will soon be turning out several thousand wire wheels per day.

New Storm Tool for Aligning Ford Main Bearings.

In order to provide a certain and rapid means of aligning faulty Ford main bearings the Storm Mfg. Co. has brought out a new bearing reamer jig and straightening

gauge. Formerly scraping or reaming has been about the only remedy but neither was satisfactory, as often the relative position of the parts was changed, causing the cam gears to mesh improperly.

The new Storm tool is said to make a new perfect bearing exactly the same as the original and in the exact original position. The jig which holds both the bab-



Storm Bearing Reamer Jig.

bitting arbor and the boring bar is held in correct position and alignment by an aligning arbor passing through the camshaft bearing holes. The babbitting arbor is $\frac{1}{8}$ inch smaller than the crankshaft, allowing ample space for the pouring of the metal and providing surplus metal to be cut away by the boring bar, which has four cutters for each bearing.

Full details and trade prices can be obtained by mentioning the American Garage & Auto Dealer when writing to the Storm Mfg. Co. at Thompson, Iowa, until August 1, and after that at 406 Sixth avenue, South, Minneapolis, Minn.

"Norwesco" Announces Completion of New Canadian Factory.

The Northwestern Chemical Co., Marietta, Ohio, has just announced that its new Canadian factory at Ville St. Pierre, Montreal, Quebec, is completed. General Manager F. R. Hall states that it will employ only Canadian labor and sell throughout the Dominion. All the products will be placed on the market in Imperial measure containers. By making the Norwesco line in Canada, jobbers, dealers and motorists will save from 40 per cent to 70 per cent in duty.

The Canadian branch will be managed by Prescott W. Robinson of Montreal, who will also have charge of sales in the Eastern Provinces—New Brunswick, Ontario, Quebec, Nova Scotia and Prince Edward Isle. The sales offices will be located in the Drummond Building, Montreal. E. Victor Vallance will have charge of Manitoba, Saskatchewan and Alberta sales, with offices in the Confederation Life Building, Winnipeg. I. D. Cross, with offices at 77 O'Farrell street, San Francisco, will have charge of British Columbia sales.

Bergie National Spark Plug Co. Changes Its Name.

The use of two names in the company title has resulted in so much confusion that the Bergie National Spark Plug Co. has recently changed its corporate name to "National Spark Plug Co." so that it will correspond with the name of the National sparkplug.

There will, however, be no change in the officers of the company, or in the management, which will remain the same as heretofore. The change is merely made to shorten the company name and make it easier to remember that National spark-plugs are made by the National Spark Plug Co. of Rockford, Illinois.

Henry Beneke Has Joined Rayfield Carburetor Concern.

Beneke & Kropf Mfg. Co., as successors to Findeisen & Kropf Mfg. Co. of Chicago, will hereafter produce Rayfield carburetors. Henry Beneke, having purchased the entire interests of Frederick Findeisen, becomes vice-president and treasurer of the reorganized corporation. He comes from the vice-presidency of Hibbard, Spencer, Bartlett & Co., with which he has been associated for the past 27 years.

O. F. Kropf remains with the reorganized concern as active president. E. A. Bates continues as director of sales and advertising in the new organization. The present manufacturers of the Rayfield are enlarging both plant and equipment. Thousands of dollars' worth of new machinery, tools and dies have already been installed.

Packard Engineering Co. to Sell Tested Equipment.

The Packard Engineering Co. has opened an office at 1824 Euclid avenue, Cleveland, and is acting as sales engineer of thoroughly tested equipment. The concern is distributor in Northeastern Ohio for Miller carburetors, Frayer wire wheels, and Roof overhead valves, as well as Ford speed equipment and special bodies. Other lines will be added after having been tested out by members of the concern.

J. W. Packard, one of the directors of the Engineering Co., was formerly President of the Packard Motor Car Co. Another director, Warren Packard, has been assistant inspector of engineering materials at the Curtis Airplane plant in Buffalo. The advertising manager, Lt. W. R. Davis, has been in charge of power plant installation in the Navy dirigible balloons at the Goodyear works in Akron. Lt. C. C. Price, the technical man, has been in charge of the Aviation station equipment along the Atlantic Coast, with headquarters at the Navy department, Washington.

AIR COMPRESSOR FITTINGS

BRUNNER

Take Valves for Instance:

Ordinary valves will not hold compressed air. Special design, selected materials and extreme care in perfecting a ground fit are necessary in making a satisfactory air valve. Hand operated or automatic—each type is an individual engineering problem. Brunner engineers have perfected air valves and other fittings, that Brunner outfits might not at any time give unsatisfactory service because of some apparently unimportant part.

Take Air Hose as Another Example:

Think of the trouble you have had with poor hose. Brunner "Resistoil" Air Hose has been designed and made to avoid even this trouble with Brunner outfits. And, so on down through the list,—Reducing Valves, Controllers, and all compressor accessories; each item is a perfect unit to make a perfect assembly.

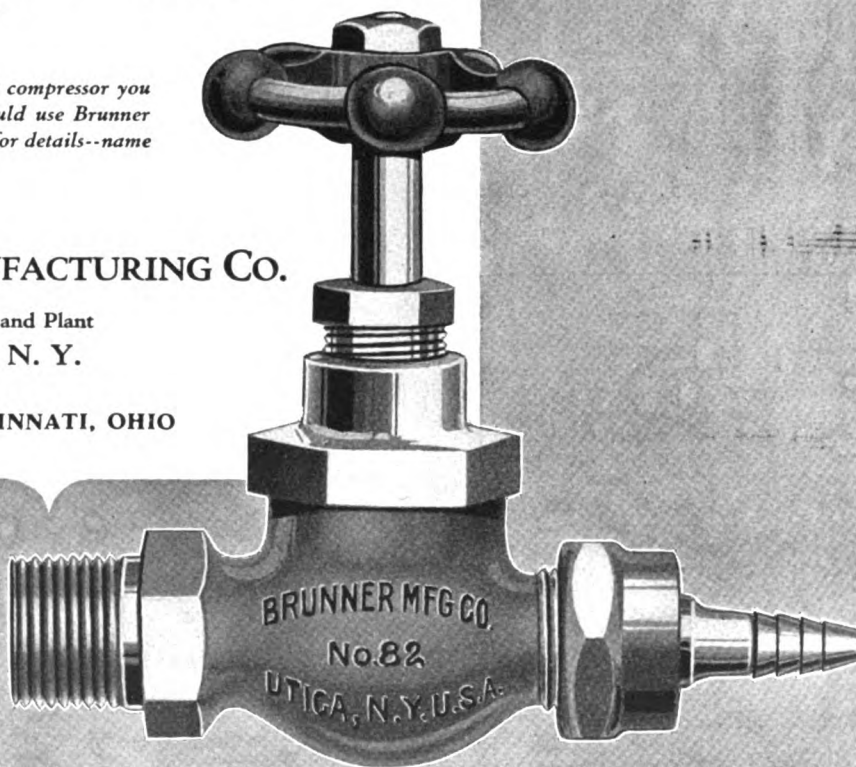
A compressor outfit is no better than its component parts. One poor fitting anywhere in the system will prevent good service. For safety and convenience to yourself and for service to your trade, equip your outfit with Brunner fittings.

Regardless of what compressor you are using, you should use Brunner fittings. Write us for details--name your jobber.

BRUNNER MANUFACTURING CO.

Main Office and Plant
UTICA, N. Y.

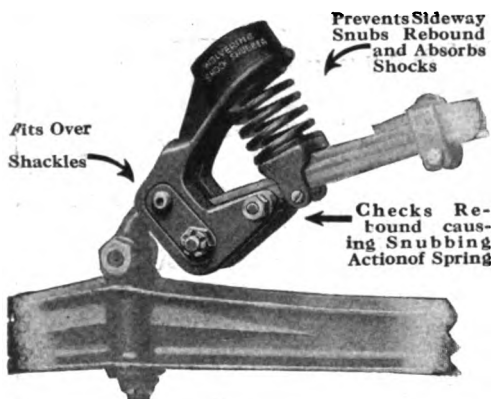
Branch—CINCINNATI, OHIO



Accessories and Garage Equipment

NEW SHOCK SNUBBER FOR FORDS.

The Wolverine Parts Co., of Hastings, Mich., is introducing the Wolverine shock snubber for Ford cars. Officials of the concern claim it prevents sideway, snubs and checks rebound through an entirely new and exclusive principle. That is, the snubber overcomes the sideway at its source, the spring shackles, thereby greatly increasing steering efficiency, relieving driving fatigue and saving tires.



Wolverine Shock Absorber.

The Wolverine, they say, prevents rebound and spring breakage by combining the action of previous types of shock absorbers and snubbers. It creates but one gradual rebound, which is mild and without sideway.

In general the manufacturers claim for the Wolverine shock snubber that it prevents sideway, absorbs rebound or back-throw, prevents spring breakage, increases tire mileage, prevents accidents, increases steering efficiency, relieves driving fatigue, and best of all, increases the second-hand value of all Ford cars. This accessory is guaranteed.

NEW OVERSIZE PUSH ROD PILOT REAMER ON MARKET.

An oversize push rod pilot reamer has been added to the line of Ford "speed up tools" marketed by Stevens & Co. This new pilot reamer is expected to become largely used by Ford repair men owing to the necessity for using oversize push rods after a Ford has been in service for several years.

Because it is difficult to keep the ordinary type of reamer from wobbling the new Stevens reamer is made extra long. It is provided with a long pilot which extends through the push rod guide and partly into the valve stem guide. The reamer is thus held steadily and can work in a true line. Stevens & Co., 375 Broadway, New York City, will send full details and trade prices to dealers who write to them, mentioning the American Garage & Auto Dealer.

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....

.....

.....

Name

Address

DUPLEX RIM DEVICE DESIGNED FOR USE WITH SPLIT RIMS.

It is declared that all the hard work of replacing tires on demountable split rims is eliminated by the use of the Duplex rim device. It is simple in design, and has no clamps or sliding arms to adjust. A woman can use it as easily as a man, because it operates through mechanical ingenuity instead of muscular exertion.



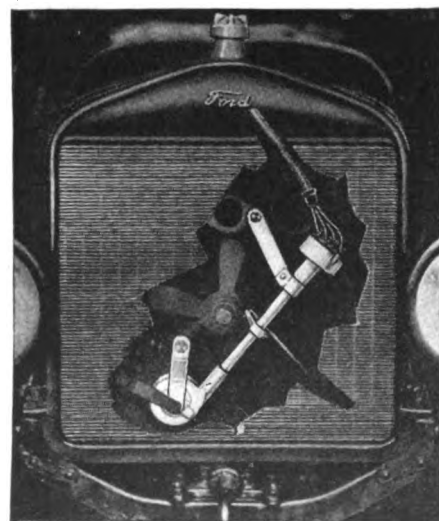
Duplex Rim Device.

The device fits any tire and make of split rim, straight slide or clincher, operating all in the same way. It will unlock and lock any make of rim and do all its work without injury to tire or rim. The center action of the lever, guided by the disc at the bottom, eliminates all side strain and delivers a straight pull and push.

The double hook claw prevents slipping and the extra hook on one end, to be used nearest to the split, is for the purpose of contracting the rim equally on both sides. Full details and trade prices can be obtained by writing to the Duplex Rim Device Company, 7546 South Chicago avenue, Chicago, Ill., mentioning the American Garage & Auto Dealer.

NEW FORD TIMING SYSTEM.

One of the newest and improved timing systems for Ford automobiles is the Mill City timing system, now being placed on the market by the Mill City Company, Minneapolis, Minn. Experience with this timing system so far is said to have shown it to give positive ignition under all conditions. It is placed in an upright position between the radiator and the engine. This keeps it up high and dry, out of the grease and dirt. Among its numerous other distinctive features are its accessibility, heretofore thought impossible in Fords. Whenever the Mill City timing system needs inspection, all parts can be reached by merely lifting the hood of the car.



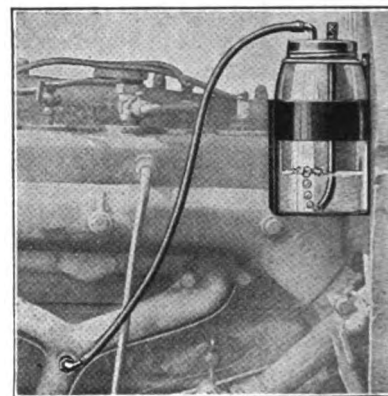
Mill City Timer for Fords

The system is thoroughly factory tested. There are already many of these systems that have run over 15,000 miles and are still giving excellent service. Other tests have been carried out relative to the time it takes

to install the Mill City system on Fords. It was found that this system can be installed complete in the average time of 30 minutes. All parts come completely assembled and can be put on the Ford without having to change the automobile in any way. It is being installed on Fords instead of making ignition repairs. It is said to be simpler, quicker and cheaper than to bother with the old worn timers.

WORK RITE CARBON REMOVER IS EASILY ATTACHED.

Ease of attachment is one of the virtues claimed for the Work Rite carbon remover by its maker. The device provides a simple form of applying a principle used for years in explosive engine work, that of mixing a small amount of water with the gasoline to make a better mixture. It is said to be especially good with the grades of fuel now obtainable.



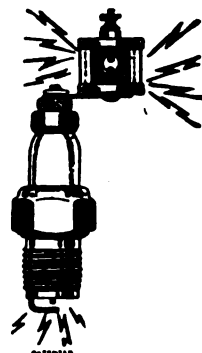
Workrite Carbon Remover.

The device consists of a metal frame for holding a quart jar containing water, which can be readily attached to the dash, engine or any convenient place. The jar cap has an adjustable inlet valve and an outlet connection. A rubber tube runs to the manifold, where it is attached with a one-eighth inch pipe thread connection. Air is drawn through the water by the engine's suction and this vapor mixes with the gasoline. The oxygen in the water burns the carbon in the cylinders and is claimed to make a material saving in fuel bills. Trade prices and full details can be obtained by writing to the Workrite Mfg. Co., 5606 Euclid Ave., Cleveland, Ohio, mentioning the American Garage & Auto Dealer.

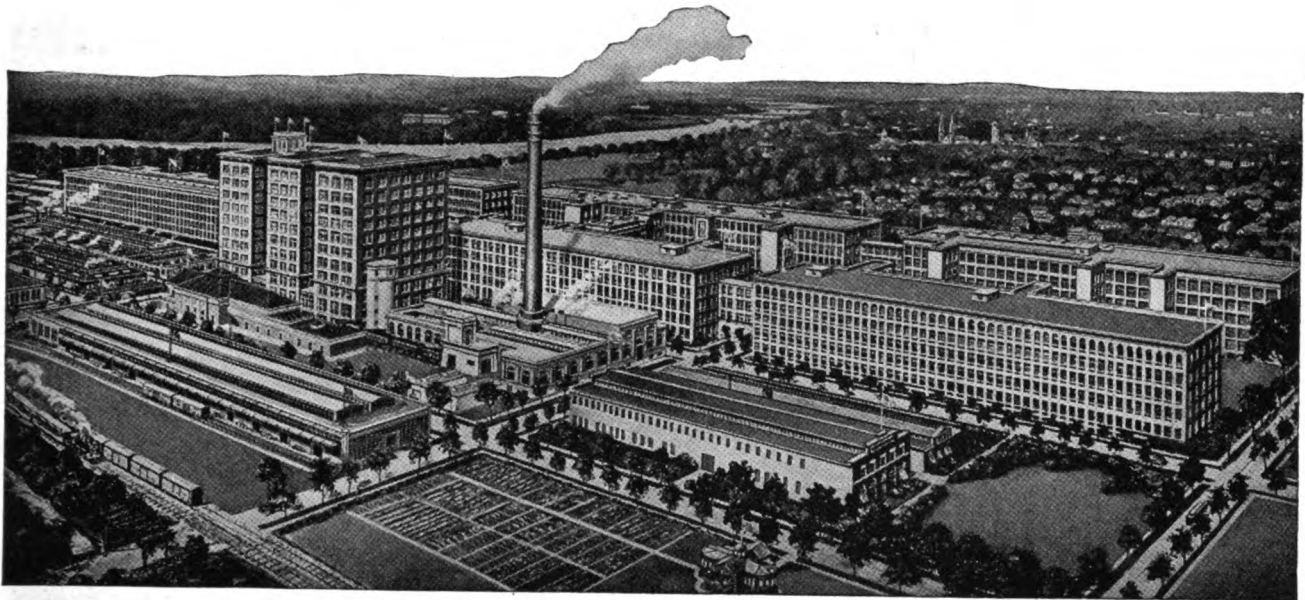
SURE FIRE INTENSIFIERS DESIGNED TO HELP SPARKPLUGS.

The maker of the Sure Fire spark intensifiers declares that their use ends the bad effects of heat, oil and carbon on sparkplugs. It is said that after a set of Sure Fire spark intensifiers have been installed that they will increase the voltage of the ignition system and make the current jump the gap of the sparkplugs.

Among the claims made for the Sure Fire intensifiers are: It makes any sparkplug fire, even with broken porcelain; it produces such a hot spark that it explodes all the charge, burns excess oil and keeps cylinders free from carbon; no matter how badly a sparkplug is choked with carbon, oil or grease it makes it fire better than new; it keeps sparkplugs absolutely clean; it saves gasoline by exploding leaner mixtures; it makes starting easier in cold weather; does not injure any part of the ignition system and does not require any more current. Full particulars and trade prices can be obtained by writing to the Motor Economy Co., P. O. Box 705-S, Cincinnati, Ohio, mentioning the American Garage and Auto Dealer.



Sure Fire Intensifier.



We make more than 275 National Cash Registers every day

The National Cash Register is a modern, labor-saving machine that helps merchants, clerks, and their customers.

It protects profits by stopping leaks and losses, temptation and mistakes.

It adds, records, and classifies many kinds of transactions.

It saves time and money because it does 15 things in 3 seconds.

It enables the merchant to give quick, accurate service.

It more than pays for itself out of what it saves.

It helps merchants make more money, with less expense.

This big plant makes nothing but National Cash Registers

The National Cash Register Company
Dayton, Ohio

Offices in all the principal cities of the world

Automotive News Notes.

Joseph C. Weston has been elected vice-president of the Ajax Rubber Co. and will have charge of the direction of the sales policies of the concern, relieving President Horace de Lissar of this work. Mr. Weston began selling bicycle tires for Morgan & Wright of Chicago more than twenty years ago, his first territory being the Southern portion of the lower peninsula of Michigan. When the Morgan & Wright business was taken into the United States Tire Company, he was sent to San Francisco to look after the Pacific Coast territory. Later he was brought East and for some time has been a vice-president in charge of sales for the United States organization, with offices at New York.

C. C. Hanch has been appointed general manager of the Maxwell Motor Co. and will direct the affairs of the Maxwell and Chalmers organizations at Detroit. He recently concluded a study of automotive business conditions in Europe for the National Automobile Chamber of Commerce, after retiring as chief of the War Industries Board's automotive products section. Before that he was treasurer of the Studebaker Corporation and had previously been with the Marmon concern.

George S. Shugart has been appointed general sales manager of the United States Tire Company. He had been general manager of branches for about a year and has had many years of experience with the United States organization and one of its constituent companies—Morgan & Wright.

Announcement has been made that production of Stevens-Duryea passenger cars will be resumed at Chicopee Falls, Mass., by J. Frank Duryea, W. M. Remington and their associates. The making of Stevens-Duryea cars was discontinued in 1915.

Guy W. Vaughn, who was recently director of Hispano-Suiza airplane engine production at the plant of the Wright-Martin Aircraft Corporation, has become general manager and vice-president of the Van Blerck Motor Co., at Monroe, Mich. Before the war he was sales chief of the Stearns car organization. Years ago he designed a passenger car that was named for him, after having been a racing driver for several years in order to test out his ideas as to design and construction.

Benjamin Briscoe and Rodolphe Stahl, forming the American firm of Briscoe and Stahl, who are designing and building in America a car for manufacture on a large scale by Bellanger Freres, of Paris, France, will be ready for quantity production within four months. The car, now in design, will be manufactured in the great factory of the Bellanger Freres, in France, and American materials will enter into its construction. American machines and tools will be purchased by Briscoe and Stahl and shipped abroad. The materials purchased will be shipped to a large warehouse in New York and after assortment there will be shipped to Europe where the car will be assembled from the American material and parts manufactured on American design there.

O. A. Loew has become production engineer for the New Era Spring & Specialty Co. at Grand Rapids, Mich. For several years he was superintendent of the Globe Machine and Banding Co. and of the Gabriel Mfg. Co. at Cleveland and later with Hayes Mfg. Co. at Detroit.

Norman I. Taylor has recently taken up the duties of advertising manager of L. A. Young Industries, Inc., of Shelbyville, Ind.

Hal G. Trump, for the last four years manager of the Chicago office of the Green-Fulton-Cunningham Co., has joined the staff of the Campbell-Ewald Co., Detroit, Chicago and New York, with headquarters at the Detroit office. He was at one time advertising and assistant sales manager of the Van Dyke Motor Car Co. and much of his training has been along automotive and farm implement lines.

Guy N. Stevens has just resigned as assistant secretary of the Olympian Motors Co., Pontiac, Mich., and been elected vice-president and treasurer of the Rex Tool & Machine Co. of the same city. He is also assistant secretary of the Power Truck & Tractor Co. at Detroit.

Claude Greenhoe has been appointed chief engineer of the motor bearings division of the Hyatt Roller Bearing Co., Detroit, according to an announcement by B. G. Koether, manager of the concern. He was formerly with the Militor Corporation, Republic Truck Co., King Motor Car Co., and the American Gear & Mfg. Co.

W. H. Diefendorf of Syracuse, N. Y., has resigned as chief engineer and director of the New Process Gear Corporation and is now with the Weeks-Hoffman Co. of the same city.

Walter P. Hanson, a well known magazine and newspaper writer, has been made assistant advertising manager of the Haynes Automobile Co., Kokomo, Ind. Gilbert U. Radoye, advertising manager of the Haynes Company, announces that Mr. Hanson will have charge of the Haynes Pioneer, the official Haynes magazine.

Jonathan John Buzzell has been appointed advertising manager of the Motor Equipment Division of the United Motors Corporation, Detroit. He is well known as the author of "Letters That Make Good" and "Sales Letter Writing."

C. Harry Raymond has organized the Raymond Motor Co., Inc., at Petersburg, Va., and will handle Chevrolet and Oakland cars in that territory. He was formerly factory representative for Chalmers and Overland cars and for the last three years was sales manager for the Stockell-Myers Hardware Co. of Petersburg, distributor for Haynes, Oldsmobile and Overland cars.

R. G. Wells has been promoted by the Hyatt Roller Bearing Co. to the post of chief engineer of the Hyatt factories at Newark, N. J.

Harry F. Keegan has been put in charge of the new Chicago office which the Van Dorn & Dutton Co. of Cleveland has opened in the First National Bank Building.

J. L. Hardig, formerly advertising manager of the Remy Electric Co., has been appointed assistant advertising manager of the Motor Equipment Division of the United Motors Corporation, Detroit.

A New York branch office has been opened at Room 317, 30 Church St., by the Van Dorn & Dutton Co., of Cleveland, with John Keegan as manager.

F. H. Prescott has been appointed designing engineer on motor and generator equipment of the Remy Electric Co. He was a designing engineer with the Westinghouse Electric & Mfg. Company's automobile equipment section when he joined the Government's engineering reserve corps in December, 1917.

Motor Truck Movements.

Sales and executive offices, including the office of the advertising manager, of the Fulton Motor Truck Co., are now located in the Ford administration building at Broadway and 54th street, New York. The Fulton Motor Truck Co. will remove the offices from the factory at Farmingdale to the heart of the automobile district. An entire floor in the Ford building has been taken, and the company will display the Fulton truck line.

Harris N. Pickett, recently appointed advertising manager of the Ohio Trailer Co., Cleveland, has served the advertising needs of prominent automotive material manufacturers over a period of several years. He was formerly advertising and assistant sales manager of the General Asbestos & Rubber Company.

Roy Davey, assistant general sales manager of the Bethlehem Motors Corporation, announces the closing of a contract with the Cadillac Motor Sales Co., Winnipeg, Manitoba. The company handles the Cadillac and Dodge Brothers car in that territory.

John M. Robbins is vice president of the Fulton Truck Co., of Nebraska, formed recently to distribute the Fulton truck in the State of Nebraska. For 15 years Mr. Robbins has devoted his entire attention to the passenger cars. The Fulton Truck Co. has taken sales rooms at 2054 Farnam Street, Omaha. Western Iowa and South Dakota and all Nebraska sales will be handled from this address. Mr. Robbins was western sales manager of the Chalmers Motor Co. until the time of the leasing of the Chalmers business by the Maxwell company.

Having succeeded as a Commerce truck dealer in Wapwallepen, Pa., the Heller Sales Co. of that place has taken over the distribution of Commerce trucks in Wilkes-Barre, Pa. Wapwallepen has a population of less than 300, but the Heller concern sold more than 100 Commerce trucks in that territory.

In the Tractor Field.

The Cleveland Tractor Co. of Cleveland, Ohio, has adopted the name Cletrac as the registered name of its tractors. The phrase tank-type-tractor is to be used in connection with the name, since the Cletrac is of crawler construction.

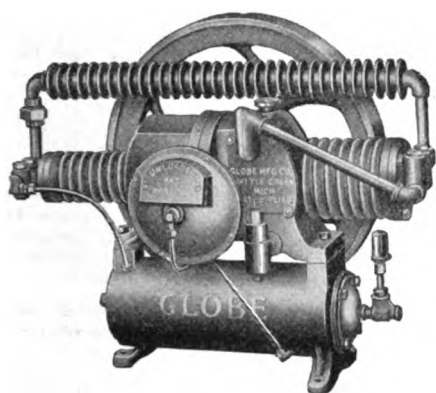
S. H. Small has become advertising manager of the Hession Tiller & Tractor Co. at Buffalo. He resigned a similar post he held with L. A. Young Industries, Inc., of Detroit, to take up his new duties.

Announcement has been made by President Dent Parrett of the Parrett Tractor Co., that the concern has moved its executive offices from the Fisher Building, Chicago, to the plant at Chicago Heights, Ill.

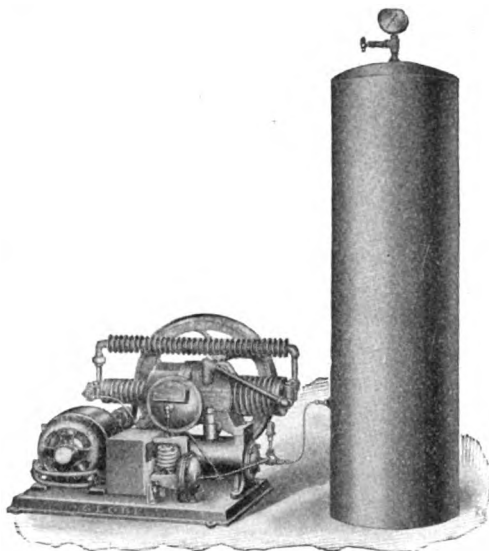
At the recent annual stockholders meeting of the Cleveland Tractor Co., R. T. Hodgkins, general sales manager, was elected a director of the company. At the meeting of the directors he was elected a vice-president.

The Beeman Garden Tractor Co., Minneapolis, Minn., has issued a new catalogue describing its light one horse garden tractor. There has been no change in the motor and the concern declares its tractor will perform any power work of a 4 horsepower engine.

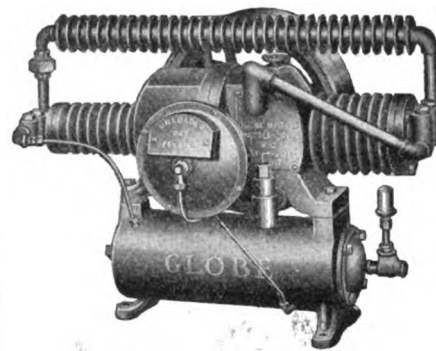
R. L. Frost has been appointed production manager of the Parrett Tractor Co. plant at Chicago Heights, Ill. He was formerly supervisor of the Ford Motor Company's assembling plants at important distributing points throughout the country.



GLOBE TYPE B
The Original Two Stage Garage
Compressor



GLOBE Complete
Automatic Air Plant



GLOBE TYPE B
Two Stage Compressor for
Belt Drive

Whatever type of air compressor you want there's a **GLOBE** Model which will suit you best

GLOBE compressors have been a big factor in the noteworthy improvement of air service during recent years. They represent the latest and highest developments in air compressor construction.

They are made on the two-stage principle which has proved the most dependable for garage purposes, as it produces ample pressure for inflating the heaviest truck tires.

The GLOBE line includes a number of models, among which is one that will just fit your purposes. The design and workmanship of GLOBE compressors

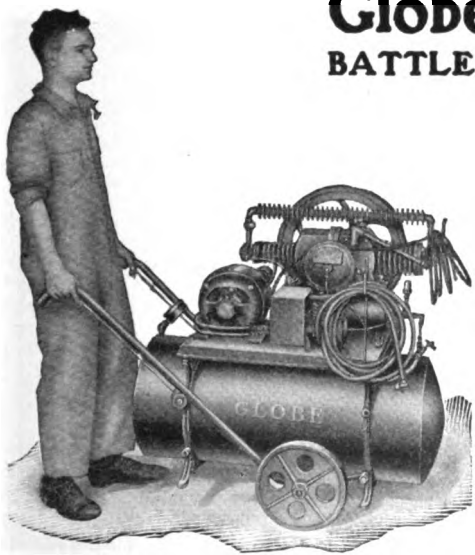
are unexcelled as you can readily see by consulting their specifications.

During recent months our new model, the "Victory," has acquired extensive popularity in the garage field. This type (shown below) is a complete automatic motor drive compressor unit, substantially mounted on steel air storage tank, beautifully finished, and making the most compact, attractive and practical automatic air plant.

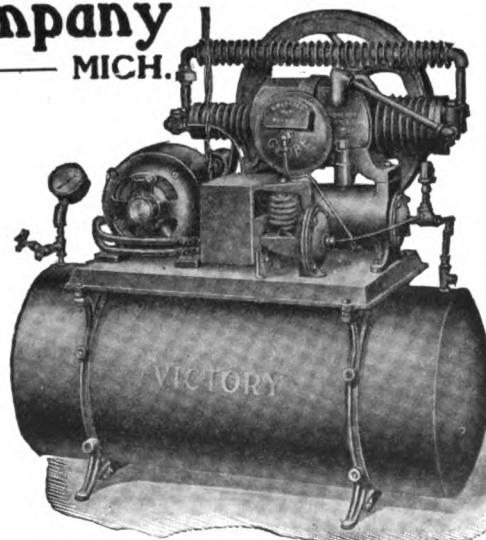
Insures a dependable supply of compressed air at all times. Also furnished in portable type with truck attachment and cord.

Let us send you GLOBE literature.

Globe Mfg. Company
BATTLE CREEK ——— MICH.



"VICTORY-PORTABLE"



"VICTORY" Complete Automatic
Motor Drive Unit

Storm Manufacturing Company Moves to Minneapolis.

O. W. Nelson, general manager of the Storm Manufacturing Company, Thompson, Iowa, announces that on and after August 1 the main office and factory will be located at Fourth street and Sixth avenue, South, Minneapolis. The Thompson

The new home is a strictly modern structure, well lighted and affording ample room for present needs, as well as provision for expansion. The location is not entirely new to the company, as the Minneapolis branch factory has occupied first floor space in the building for the past two years or more, and the present change

in different oversizes.

After August 1 all communications should be addressed to the Storm Manufacturing Company, 406 Sixth avenue, South, Minneapolis, Minn.

Eccolene Mfg. Co. Reincorporates and Increases Capital.

The Eccolene Manufacturing Co. has been reincorporated under the laws of Michigan and has met all conditions of the laws of the state of Ohio, allowing of the transaction of business in that state. The authorized capital stock is now \$500,000, of which \$200,000 is cumulative preferred and \$300,000 is common. The company is now offering \$100,000 of the preferred and \$50,000 of the common stock.

The company manufactures a product called Eccolene, used in gasoline or kerosene fuel for all kinds of automobiles, motor trucks, motor boats, tractors, airplanes and stationary motors. The treatment of fuel with Eccolene is claimed to result in 25 to 50 per cent saving in fuel consumption and removes and prevents carbon formation. The dynamometer test made by the American Automobile Association gave to the company a certificate of merit.

Subscribers who mention AMERICAN GARAGE & AUTO DEALER in writing advertisers are guaranteed good treatment. No doubtful advertising is accepted.



Building for New Storm Plant at Minneapolis.

shops will be continued temporarily for manufacturing purposes only and it is planned to have the entire organization in the new home before the end of the year. Increasing business demands considerable more floor space and better shipping facilities, both of which are accomplished by this change.

is in accordance with the original plans.

The concern manufactures Storm cylinder reboring machines, both for hand and power operation; also connecting rod bearing reamers, jigs and straightening gauges, valve port renewing tools, main bearing babbiting and boring tools, piston vises and also special pistons for all makes of motors



LEO Mc DANIEL RUBBER CO.


There's good Profit for you in selling our Remade Tires

Send us the old tires that accumulate in your shop. Even if they are sand blistered, rim cut, punctured, or blown out, we remake them by a process that gives them 5,000 more miles.

You can sell these remade tires at a good profit.

Write today for particulars.

LEO Mc DANIEL RUBBER CO.
804 Commercial Ave., Cairo, Ill.



Business thrives when they're around

People invariably patronize garages which give honest service. If you have either an

EKERN MODEL N or MODEL K PORTABLE GARAGE GREASE GUN,

your sales of grease or oil will be publicly registered.

Portable, practical and clean guns.

The EKERN is the only hand operated gun on the market that will work any weight of grease as well as oil.

Model K holds 20 lbs. grease or 2½ gals. oil.
Model N holds 56 lbs. grease or 7 gals. oil.

So that you may become better acquainted with the "money-making" advantages of PARO specialties send for copy of our new booklet.

Your regular jobber can fill your order.

H.G. Paro Co.

1412-14 South Michigan Boulevard, Chicago, Ill.

BRING THESE PROSPECTS TO YOUR STORE

There are thousands of Ford owners that are passing your place every day to whom you could easily sell the Burgess "Triple Duty" Rebound Check and Shock Absorber.

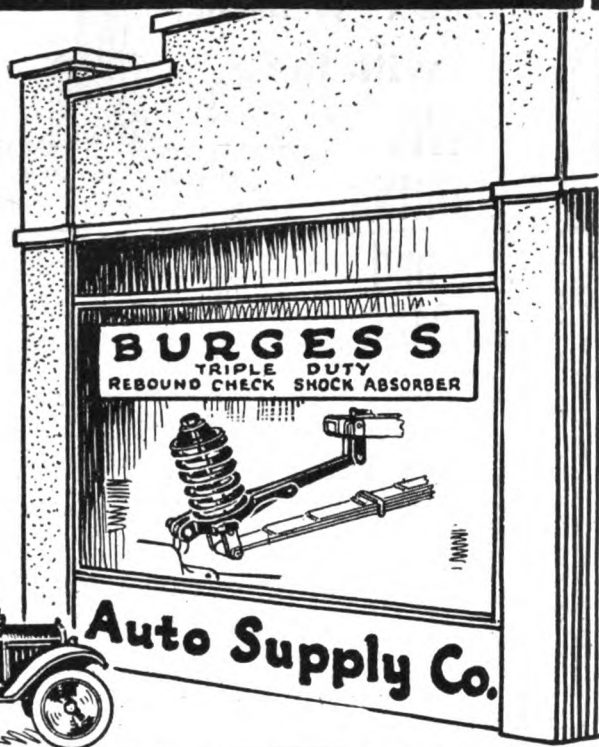
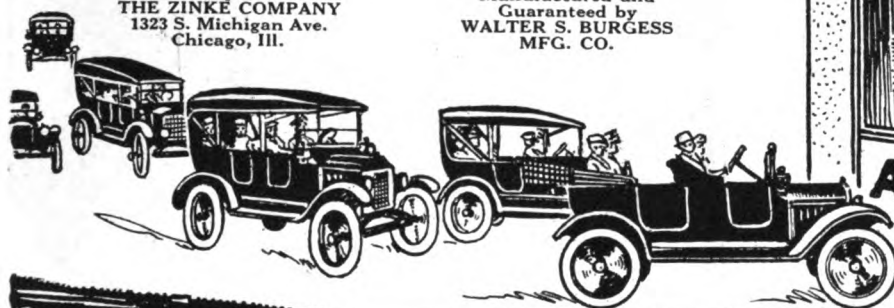
It's just the thing they are looking for—three devices in one—a comfort maker, a tire and gas saver.

A shock absorber that does what others claim. Backed by an ironclad guarantee for perfect satisfaction.

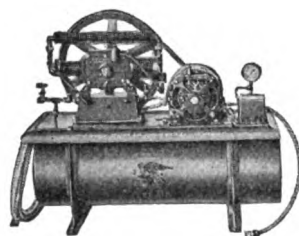
Write us today for full particulars of our attractive dealer proposition.

Sales Department
THE ZINKE COMPANY
1323 S. Michigan Ave.
Chicago, Ill.

Manufactured and
Guaranteed by
WALTER S. BURGESS
MFG. CO.



Consider
this
indication



any
air
compressor

before buying

Usaco
AIR COMPRESSORS
TRADE MARK

BUYERS of air compressors must recognize the changed tire inflating conditions brought about in the last two or three years.

They must consider that truck tires are now in common use requiring upwards to 140 pounds instead of the former maximum of 80 to 90 pounds; they must consider also that the number of cars and consequently the actual operating demands on air compressors are increasing at an enormous rate.

These conditions must be considered seriously if the machine purchased is to deliver the kind of service and the length of service justly to be expected. Therefore if purchasers act wisely they will buy a compressor designed specifically for high pressure service and one that has proved its fitness for this service beyond a question of doubt.

The Usaco Two Stage De Luxe Automatic Air Compressor is just such a machine. After exhaustive tests it was adopted by the Government for camp service here and abroad to eliminate the enormous expense that had been incurred as a result of underinflation. Needless to say it met the demands most satisfactorily, as it has done and is doing in thousands of the better garages.

No one can possibly appreciate the exceptionally high character of this machine without studying its unusually efficient Two Stage construction and the various improved features it embodies. These facts are clearly illustrated and described in our catalog and literature, copies of which should be in the hands of every garage and tire man.

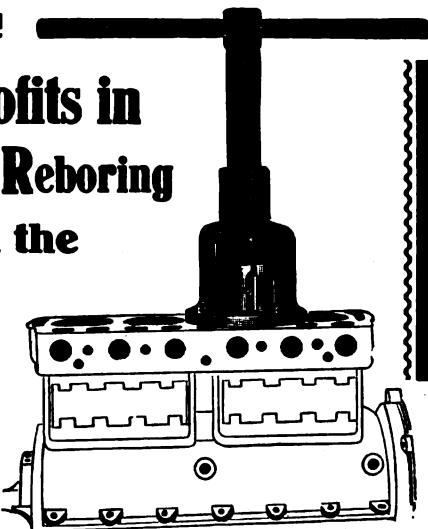
6542 Carnegie Ave. **The United States Air Compressor Co.** CLEVELAND OHIO

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Big Profits in Cylinder Reboring

with the

DAVIS REBORING JIG and REAMER



You can rebores old Ford cylinders, and by getting new pistons (1-32 inch oversize) you can make an engine as good as new. This is no exaggeration—old cylinders being thoroughly "seasoned out" are actually superior to new ones.

There is a big demand for this class of work among Ford owners and as soon as you are known to have the equipment, you will get your share.

With a Davis Reboring Jig and Reamer, one man can rebores a set of four cylinders in 60 minutes, and do as good a job as the large shops. And you make a good profit.

We also make a milling attachment for drill press.

Write today for particulars.

HINCKLEY MACHINE WORKS, Hinckley, Ill.

GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company

1002 Washington Boulevard
Chicago, Illinois



"AM-PĒ-CO" PRODUCTS

Sell readily because their superiority
is well known to the Motoring Public

"AM-PĒ-CO" PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. "AM-PĒ-CO" Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes.

We also make the famous "AM-PĒ-CO" WHEEL PULLERS and BRAKE SHOES, both one- and two-piece.

If your jobber does not handle "AM-PĒ-CO" Products, write us direct.

F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

General Selling Agent for

**American
Machine
Products
Co.**

Marshall-
town,
Iowa



Your Repair Jobs Can
Be Charged Correctly

**The Calculagraph is a necessary
part of the repair department
of every up-to-date Garage.**

With the CALCULAGRAPH any garage knows where it stands. Never is there occasion for dispute, as the CALCULAGRAPH records when the job is started—when it is ended—and it gives the elapsed time. Thus it eliminates all chance of error—pleases the public and makes "more" money for the garage.

Garage Booklet on Request

DEPT. 77

THE CALCULAGRAPH COMPANY
30 Church Street NEW YORK CITY



**Introducing the
Latest Idea**

ROTARY AIR COMPRESSORS

For All Purposes

ADVANTAGES WORTH CONSIDERING

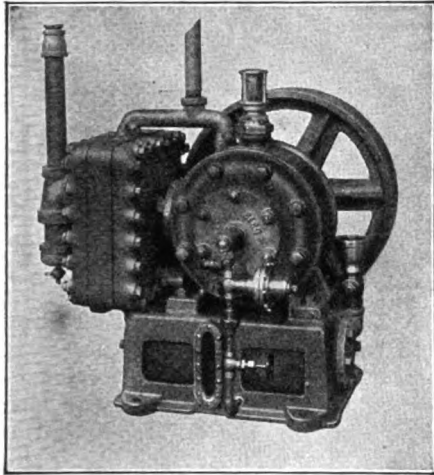
Slow Speed. No Vibration. Positive Displacement.
High Overall Efficiency. Very Low Cost of Upkeep.
No Expensive Foundations.
Easy to Install. Perfectly Balanced. Quiet in Operation.
Check Valves on Discharge. No Valves on Intake.
Simple to Operate.

*Weighs Less Than One-Half of Other Types.
All Bearings Hyatt Roller—"High Duty." Only
Five Moving Parts Always Running in Oil.*

Write for Descriptive Matter, Prices and Delivery

JACKSON COMPRESSOR COMPANY

Denver, Colorado, U. S. A.



Rotary Garage Compressors

ZELNICKER Ever-Tyte PISTON RINGS

WRITE for Booklet No. 32. It's full of valuable automobile information worth knowing.

After an eight months' laboratory test, combined with a 25,000-mile road try-out, were adopted by one of the most conservative automobile manufacturers in America in their standard production.

Garage and repair men recognize merit and efficiency. As a result Zelnicker Ever-Tytes are sold by almost every repair shop or garage.

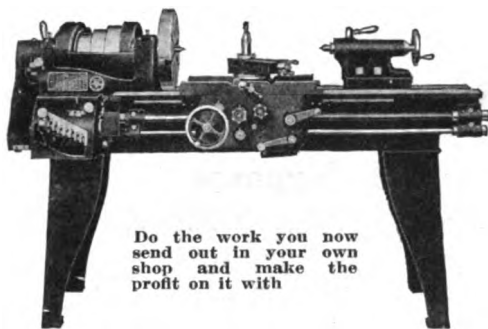
Zelnicker Ever-Tyte Piston Rings are scientifically built in three parts. The patented right-angle interlock permanently seals the joint while the six-point circular expansion provides perfect contact with the cylinder wall at all points, even though "out-of-round."

THE EVER TIGHT PISTON RING COMPANY
3124 LOCUST STREET, ST. LOUIS, MO.

If yours is an exception, send us his name and address and we will see that you are promptly supplied.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Do Your Own Lathe Work and Increase Your Profits



Do the work you now send out in your own shop and make the profit on it with

MONARCH LATHES

Recognized by repair men as Best for Garage Use, very accurate, rigidly constructed, modern in design, quick and easy to operate. Used in every class of work from the finest tool room work to the production work of the largest factory. Furnished with taper attachment, milling, key-way cutting, gear cutting and other useful attachments for garage work.

Size shown above 14" x 6". Other sizes 16, 18 and 20". Prices are within reach of every garage owner.

Write today for catalog No. 11 and prices

The Monarch Machine Tool Co.

America's Largest Lathe Builders

101 Oak Street

Sidney, Ohio



Garagemen prefer NOKORODE for its all-around usefulness in the shop.

Hundreds of garages and most of the leading manufacturers use NOKORODE because of its universal adaptability for soldering. Especially when "good service" is the best asset you have, it will be gratifying to know that when you use NOKORODE, "there is none better."

Place an order for NOKORODE now, and be ready for all your repair jobs.

Free sample with prices on request.

The M.W. Dunton Company
PROVIDENCE, R.I.
U.S.A.

No wasted "Free Air"

SNAP! When the inflating valve is removed the AIR PRESSURE STOPS

All garages and repair shops distributing free air can profitably use the

SCHRADER



**UNIVERSAL
INFLATING
VALVE**

If you have a SCHRADER valve you know that your "bottled air" is safely tucked away the minute it is taken off the tire valve. The air is released by pressing the nozzle of the inflating valve against the tire valve, and stopped by removing the device from the tire valve. Fits any diameter of hose from $\frac{1}{4}$ to $\frac{5}{8}$ inch. Price, \$1.50.

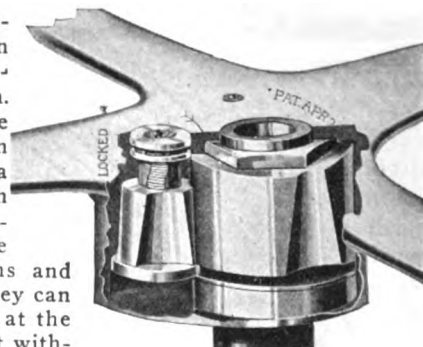
A. SCHRADER'S SON, Inc.

783-793 Atlantic Ave., Brooklyn, N. Y.

"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."



Approved by the Underwriters' Laboratories, and affords 15% discount on insurance.

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

Write today for particulars.

THE RELIANCE COMPANY

411-417 So. Sangamon St.,

CHICAGO, ILL.

Distributors in every state

**Here's The Way To Make
\$200 to \$500
Extra Profits Every Month**

We Give You Absolutely Free!

With each machine an assortment of 1,000 Ewald Special Staples—more than enough to staple enough tires to pay for the entire outfit!

Get it now and begin to make real money

Write us today and get started towards big profits. Our extremely low list price of \$20.00 is subject to an attractive trade discount—you can make enough the first day to pay for it all. Repairmen and garagemen are making as much as \$30.00 a day with the Ewald. Act now—every day you delay is money out of your pocket.



Ewald
Tire Retreader
Outfit

M'd by
ROMORT MFG. CO.
Oakfield, Wisconsin
Sales Dept.
THE ZINKE COMPANY
1323 Michigan Avenue
Chicago, Ill.



Here's More That You Get Absolutely Free of Charge!

- 1 FULL SHEET OF DIRECTIONS
- 1 CAN OF MICA TIRE POWDER
- 1 TRACING WHEEL
- 1 NOTCHED KNIFE
- 1 TIRE SPREADER
- 1 CEMENT BRUSH
- 18 FT. RELINER STRIP
- 1 CAN OF CEMENT

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

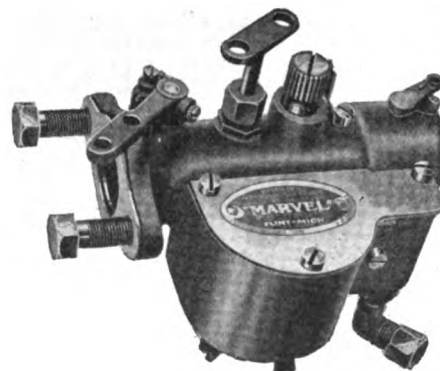
Price F. O. B. Factory \$10.00

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Maxwell, Overland, and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.





SUMMER SERVICE COUNTS



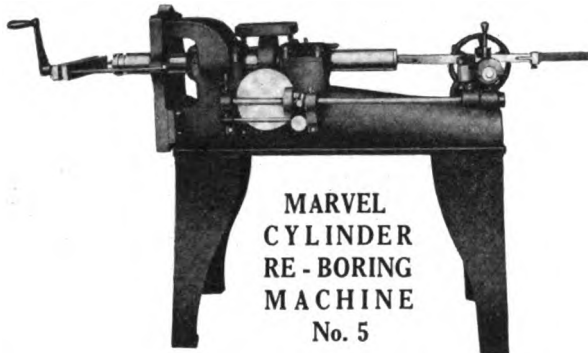
It's the real service that puts the jingle in the Cash Register the year 'round. Give a man service in the Summer and you are bound to get his business in the Fall and Winter.
Equip your shop to give Quick—Perfect—Economical Service—Make money for yourself by doing

CYLINDER RE-BORING

There is no real good reason why you cannot get this business—it is entirely up to you—we are ready to do our part—the installation of a MARVEL No. 5 in your shop enables you to Re-Bore scored or worn Gas Engine Cylinders and fit them with MARCO OVERSIZE PISTONS.

The MARVEL CYLINDER RE-BORING MACHINE No. 5 is an investment—not an expense—we show you how to get the business—the profit soon pays for a MARVEL No. 5—after that it is all velvet.

Don't put it off—write today—we'll respond promptly.



MARVEL
CYLINDER
RE-BORING
MACHINE
No. 5

MARVEL MACHINERY COMPANY
1307 S. Third Street Minneapolis, Minn.
In Writing Please Use Address in Full—It Expedites Delivery

**Disabled Cars can
be towed in quickly
with it!**

HOLMES WRECKING TRUCK

**Robt. Holmes
& Bros.**
DANVILLE-ILLINOIS

All the "comforts" of home in the modern train

America's big railroad men during the past half century have devoted intensive efforts to making travel by rail more comfortable and enjoyable. We have, likewise, studied the problems of imparting comfort and pleasure to riding in a Ford, and as a result of our efforts

**You get that same "comfy" feeling with
W & C SHOCK ABSORBERS**

They help steering, prevent side sway, save tires, and stop the triangular pull that wears out the bearings.
Over 200,000 sets in use.
Write for our trade proposition.

P. H. WEBBER CO.
Hoopeston, Ill.

Pondelick Brothers

will pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrinding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

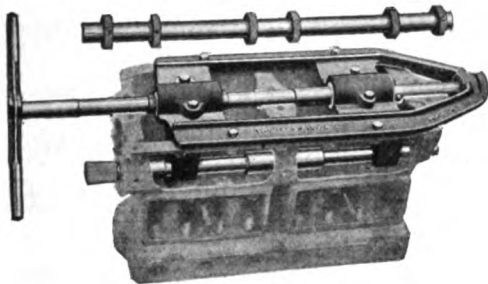
Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS



makes substantial "profits" for the garage and insures every day being a busy day



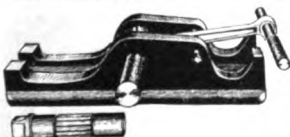
**STORM
MAIN BEARING BABBITTING AND
BORING TOOL**

Puts new bearings in old Ford Blocks. A simple and efficient tool which produces a perfect bearing in proper position and in perfect alignment, the same as a factory job.



**STORM REBORRING
MACHINES**

The garageman's best friend and biggest money maker. Made in varied capacities to meet your requirements.



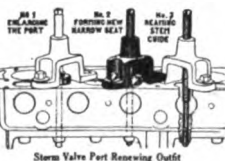
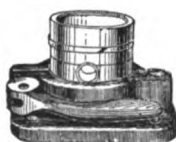
**STORM CONNECTING ROD
BEARING REAMER, JIG AND
STRAIGHTENING GAUGE**

Makes accurate fitting bearings and insures perfect alignment. With it your cheapest man can do expert bearing work.

Write for Bulletin No. E 42

STORM MFG CO.

406 6th Ave. South, MINNEAPOLIS, MINN. • STORM PISTON VISE



**STORM VALVE PORT
RENEWING OUTFIT**

Renews the Ford valve port as it should be. Enlarges the port, makes a new narrow seat and new stem guide.

"Get the Tourist Trade"



**Use a
Federal Electric
Sign**

The Federal Electric Sign attracts the attention of passing tourists and tells them where they may receive real service. It is a tireless salesman, working day and night to increase your business.

The Federal Electric Sign is beautiful and attractive. Made of porcelain enameled steel, it cannot wear out, rust or decay. The cost of maintenance is only a few cents a day for current. An occasional washing keeps it as clean and bright as new.

You Have 12 Months to Pay

The first payment brings you the sign. It will pay for itself many times over in the time it takes to complete the payments. Send the coupon today for full information.

MAIL THIS COUPON TODAY

Federal Electric Company

Representing

Federal Sign System (Electric)

Lake and Desplaines Streets, Chicago

Please send full information on Enameled Steel Sign for my business and your 12-months-to-pay plan. No obligation.

NAME

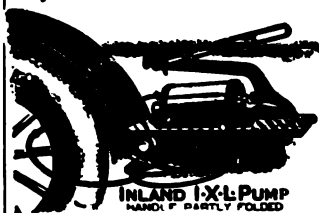
ADDRESS

BUSINESS

(AG AD-7)

When selling tire pumps why not sell the best INLAND I. X. L. PUMPS

are unequalled for power, compactness, long service and ease of operation. This running board pump develops a leverage of 18 times the ordinary foot pump yet a woman or child can operate it with ease. Strongly made of the best materials. Cylinder is a drawn steel shell absolutely air tight. Clamps



INLAND I.X.L. PUMP
HAND & PARTLY FOLDED

securely to the running board. Handsomely finished making a neat appearance.

DEALERS—This pump is a real seller because it makes good. Write today for prices and particulars.

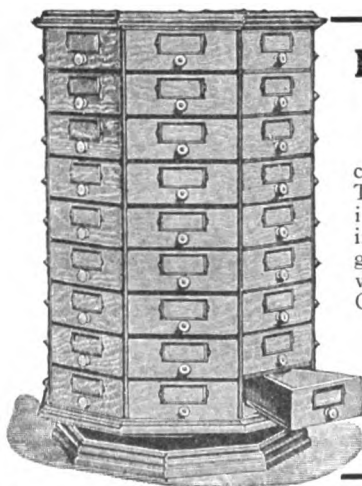
Universal Mfg. & Sales Co.
550 W. Harrison St., Chicago

ATTENTION

Garagemen, Dealers and Mechanics

We manufacture Electrical Testing, Charging and Magnetizing Instruments, and publish Books covering all Motor Car Electric Systems and Tire Repairs and Vulcanizing. New illustrated catalogue ready. Write today for it. ☐ Dealers wanted.

H. E. PHILLIPS & CO.
Dayton Ohio



REVOLVING CABINETS

Just what you want for carrying your supplies. Thousands of these Cabinets are in use by dealers in automobile sundries, garages, etc. Made in various styles and sizes. Catalog on application. Sold by leading jobbers.

American Bolt &
Screw Case Co.
DAYTON, OHIO

"CURKO" SOCKET WRENCHES

Are turned from the best Solid Bar
Stock and are Heat Treated. For

STRENGTH and RELIABILITY

They are unexcelled. Ask for dealer's discount.

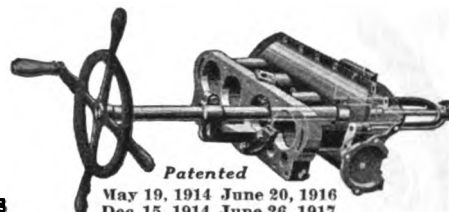
Price
\$1.50



Graham Roller Bearing Co., Coudersport, Pa.

REPAIRMEN—LISTEN!

The Heiser
Improved
Cylinder
Reboring
Tool for
Ford Motors



Patented
May 19, 1914 June 20, 1916
Dec. 15, 1914 June 26, 1917

is the only Reboring Tool in the world that is self sharpening. It is the only Tool except expensive grinders that will not leave the finished cylinder slightly tapered toward the bottom. It is the only Tool that rebores between centers—this insures a finished cylinder, square with the crankshaft, round, straight and true. It is adjustable, and the only Tool that will rebores different sizes without losing the adjustment.

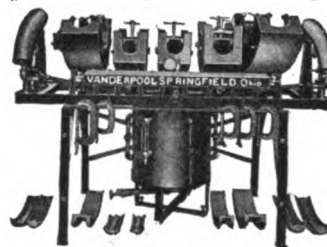
The best mechanic in the world can't build reputation without proper TOOLS and EQUIPMENT. The HEISER IMPROVED CYLINDER REBORING TOOL makes good shops out of poor ones and better shops out of good ones.

Write today for full particulars.

Heiser Special Tool Co., 115 Rogers Bldg., Kingston, Mo.

COULD YOU HANDLE \$100 A DAY

You open a Tire Repairing Shop—business
pours in—your Vanderpool Vulcanizer—



(5 Cavity) has capacity of \$100 worth of work a day. We are the pioneers in the manufacture of the DRY CURE Vulcanizer—the only vulcanizer that guarantees absolutely PERFECT work. Plain or ribbed tread. 4 Circle Molds. Write at once for FREE TIRE REPAIRING MANUAL and full particulars. In answering address Dept. H10.

WM. VANDERPOOL CO. : Springfield, Ohio

WELDING PLANTS for the Garage

BERMO WELDING PLANTS

are made in many styles. There is one that will just fill your requirements.

Welding
is highly
profitable

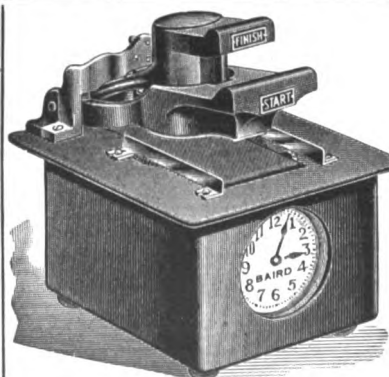
Write for particulars

A.J. BERMO CO.
OMAHA • NEBRASKA

\$25 to \$300

**3 to 6 months
to pay in small
installments**

Put your repair charges on a
profitable basis with



BAIRD TIMING DEVICES

Keep a check on your employees' time and learn exactly what each job costs. Automatic supervision turns losses into profits.

Prices moderate.
Write today for booklet.

Baird Equipment Co.
324 W. Ohio St., Chicago
Phone Superior 2071

**New
Lower Prices
Now in Effect
Write Today
for
Information**

**BATTERY CHARGING
makes the Biggest,
Safest Profits in Your
Garage if you use the**

H-B 32-Battery Charger

For **BIGGEST PROFITS AT LEAST EXPENSE**, use **HB** Charging Equipment. Actual letters from **HB** users in our files show that they make \$100 to \$450 clear profit each month. It costs them from 12c to 15c to charge batteries, and the owner pays from 75c to \$1.50.

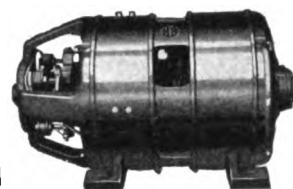
THE BIGGEST MONEY MAKER IN YOUR GARAGE Recharges 1 to 32 six-volt batteries or their equivalent at one time. **HB** Automatic Voltage Control enables you to recharge batteries of different voltage at the same time. Tapering charge puts run-down batteries in perfect condition. Easily installed and operated, requiring no electrical knowledge to handle. First cost your only cost. No burn-outs, expensive renewals, or delicate parts. Simple, sturdy, absolutely dependable, ready for use 24 hours every day.

Small Payment Puts This Money-Maker in Your Garage on Absolute Money-Back Guarantee.

Balance on easy monthly payments. Start your battery business on a profit making basis **NOW**. Mail this ad with your letterhead today for full information. You run absolutely no risk. We take all the risk.

HOBART BROTHERS CO.
Box G7 Troy, Ohio
Successful Manufacturers Since 1893

Write for information on **HB** Ball-Bearing Motors and Generators.



*You don't get
that broken
back feeling
with a*

JENSEN Tire Pump

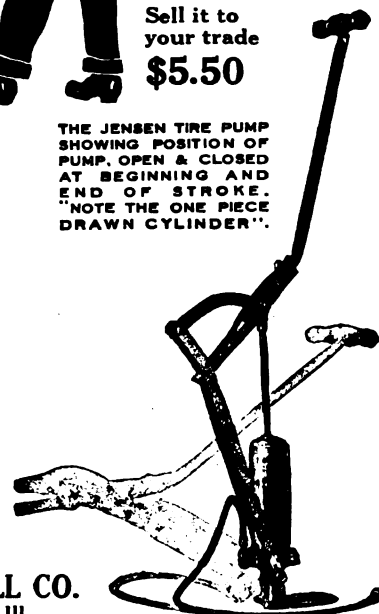
**Sell it to
your trade
\$5.50**

Your customers will want this pump because it makes such easy work of pumping tires. It produces 90 pounds' pressure with one-fourth the effort of the ordinary vertical pump, and it takes only half the time to operate. The Jensen Tire Pump is now fitted with a one piece drawn cylinder which makes it absolutely air tight—and increases its efficiency.

Purchase one and get the proof. Jobbers and dealers discounts on request.

The W. H. HOWELL CO.
10 State St., Geneva, Ill.

THE JENSEN TIRE PUMP SHOWING POSITION OF PUMP, OPEN & CLOSED AT BEGINNING AND END OF STROKE. "NOTE THE ONE PIECE DRAWN CYLINDER".



Tire Applying Press

Hydraulic Arbor Presses

**work easier
than any
others.**

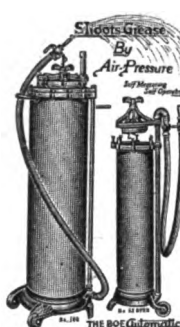
**We make
many sizes
for many
purposes.**



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SPRINGFIELD, ILL.

The AUTOMATIC and the REPEATER GREASE and OIL GUN



Improved self measuring meter—absolutely accurate. Can furnish either in Air Pressure, or Crank Operated

Used by U. S. and by nearly all Motor Car Manufacturers and by thousands of Garagemen.
Capacity 25 lbs., 50 lbs. and 100 lbs.

**Saves Time
Saves Lubricant**

Sold by over three hundred jobbers and wholesalers.

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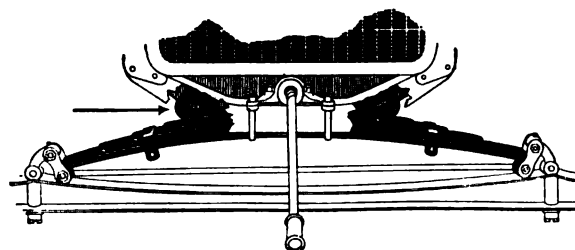


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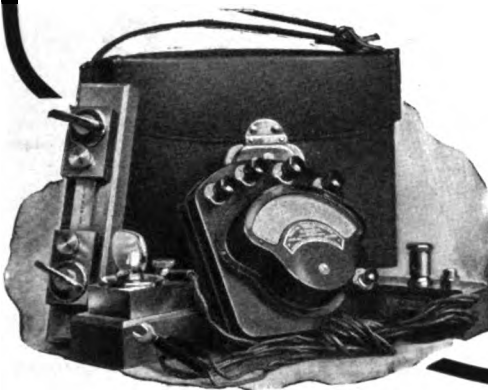
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Storm Mfg. Co., Thompson, Iowa.
Wood & Safford Machine Works, 51 No. 12th St., Great Falls, Mont.

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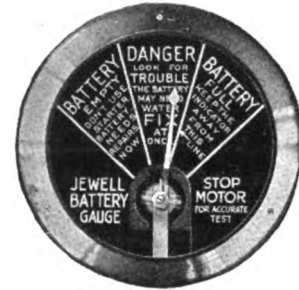
Au-to Compressor Co., Wilmington, Ohio.
The Graham Roller Bearing Co., Coudersport, Pa.

Index to Advertisements

| A | | J | |
|----------------------------------|----|---------------------------------|-----------|
| Advance Automobile Access- | | Jackson Compressor Co..... | 67 |
| ries Corp. ....3 and | 5 | Jenkins Vulcan Spring Co.... | 29 |
| American Accessories Co..... | 75 | Jewell Electrical Instrument | |
| American Bolt & Screw Case | | Co. | 77 |
| Co. | 72 | K | |
| American Machine Products Co. | 66 | Kennedy Car Liner & Bag Co.. | 75 |
| Atlas Auto Supply Co..... | 51 | L | |
| Auto Compressor Co..... | 74 | Lawrence & Co., L..... | 74 |
| Auto Engine Works..... | 74 | Lourie Mfg. Co..... | 73 |
| Auto Parts Co. | 75 | M | |
| Auto Spring Repair Co..... | 74 | McDaniel Rubber Co., Leo.... | 64 |
| Auto Wrecking Co..... | 39 | Marvel Carburetor Co..... | 69 |
| Automatic Safety Tire Valve | | Marvel Machinery Co..... | 70 |
| Corp. | 39 | Mechanical Belt Co..... | 70 |
| B | | Miami Trailer Co..... | 78 |
| Baird Equipment Co..... | 72 | Miller Rubber Co..... | 40-41 |
| Beck & Corbitt Iron Co..... | 75 | Monarch Machine Tool Co.... | 63 |
| Bermo Co., A. J..... | 72 | Mutual Truck Co..... | 36-37 |
| B. & M. Mfg. Co..... | 59 | N | |
| Boe Co., H. M..... | 73 | National Cash Register Co.... | 61 |
| Brunner Mfg. Co..... | 59 | National Rubber Filler Co.... | 78 |
| Buettner Co., Chas. H..... | 74 | National Wire Wheel Works.. | 55 |
| Butler Mfg. Co..... | 65 | New Era Spring and Specialty | |
| Burgess Mfg. Co., W. S..... | 65 | Co. | 73 |
| C | | New York Coil Co..... | 75 |
| Calculagraph Co. | 66 | No-Leak Piston Ring Co.... | 75 |
| Cassidy Co., Edward A..... | 53 | Norma Company of America, | |
| Catelain, Andre G..... | 74 | The | 6 |
| Champion Pneumatic Machinery | | O | |
| Co.....Inside Back Cover | | Owens, Frank Chas..... | 74 |
| Chicago Baling Press Co..... | 75 | P | |
| Chicago Solder Co..... | 47 | Paro, H. G., Co..... | 64 |
| Curtis Pneumatic Machinery Co. | 27 | Phillips Engineering Co..... | 72 |
| D | | Pondelick Bros. | 70 |
| Dayton Electrical Mfg. Co.... | — | R | |
| Denby Motor Truck Co..... | 7 | Reliance Co. | 68 |
| Detroit Auto Radiator Co.... | 68 | Romort Mfg. Co..... | 69 |
| Dunton Co., The M. W..... | 68 | S | |
| E | | St. Paul Auto Cylinder Grind- | |
| Eccolene Company | — | ing Co. | 74 |
| Ever-Tight Piston Ring Co.... | 67 | Schrader's Son, Inc., A..... | 68 |
| F | | Shaler Co., C. A..... | 49 |
| Federal Electric Co..... | 71 |Front Cover and | |
| Flexlume Sign Co.....Back Cover | | Spencer's Sons, L. S..... | 74 |
| Foster Bros. Mfg. Co..... | 75 | Standard Auto Salvage Co.... | 8 |
| Franklin Mfg. Co..... | — | States Chemical Co..... | 71 |
| G | | Stewart, F. W..... | 71 |
| Ganschow Co., William..... | 66 | Storm Mfg. Co..... | — |
| Garden City Spring Works.... | 77 | Strickler, T. H..... | — |
| General Utility Co.....31 and | 45 | Sunderland Machinery & Sup- | |
| Gill Mfg. Co..... | 63 | ply Co. | 74 |
| Globe Mfg. Co..... | 72 | T | |
| Graham Roller Bearing Co., | | Times Square Auto Supply Co. — | |
| The | 72 | Trexler Co. | 33 |
| Gray-Heath Co..... | 74 | Tubular Woven Fabric Co.... | 35 |
| Greer College of Motoring.... | 74 | U | |
| H | | Universal Battery Co..... | — |
| Halladay Co., L. P..... | 43 | Universal Mfg. & Sales Co.... | 72 |
| Haney & Co., J. H..... | 27 | U. S. Air Compressor Co..... | 65 |
| Hartson & Co., Inc., Thos. J.... | 57 | Utilities Sales Corp.....31 and | 45 |
| Harvey Spring & Forging Co.. | 57 | V | |
| Haywood Tire & Equipment | | Vanderpool Vulcanizing Co.... | 72 |
| Co. | 4 | W | |
| Heiser Special Tool Co..... | 72 | Wagner Specialty Co..... | 75 |
| Hinckley Machine Works.... | 66 | Warshawsky & Co..... | 74 |
| Hobart Bros..... | 73 | Waxit Mfg. Co..... | 70 |
| Hoffman Mfg. Co., Andrew.... | 70 | Webber & Co., P. H..... | 70 |
| Holmes & Bros., nc., Robert.. | 73 | Weston Electrical Instrument | |
| Howell Co., The W. H..... | 73 | Co. | 73 |
| I | | Wisconsin Auto Top Co..... | — |
| Inland Machine Works..... | — | Wood & Safford Machine Wks. | 77 |
|Inside Front Cover | | Z | |
| | | Zinke Co. | 65 and 69 |

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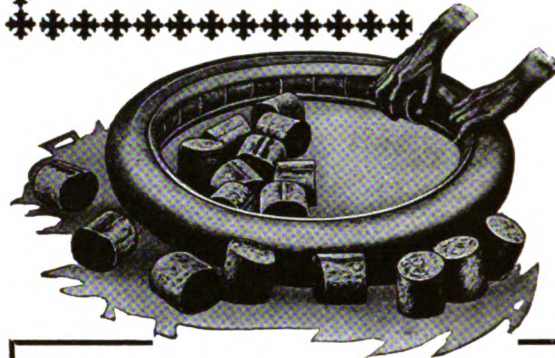


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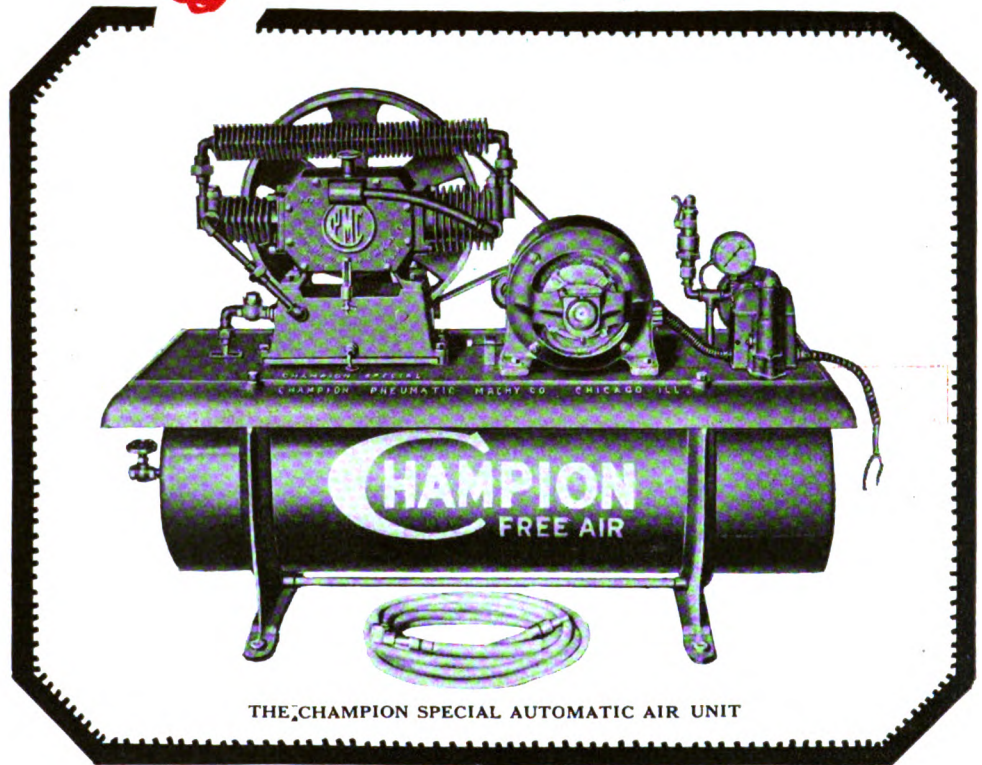
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Powerful
Dependable

The CHAMPION SPECIAL, TWO STAGE AUTOMATIC UNIT was developed by constant study and experience of the finest engineers in the Air Compressor industry.

The sturdy and substantial perfectly balanced Champion fulfills in performance all that is claimed. It has the reputation of being an extraordinary Air Compressor, with a wonderful improvement in the introduction of valves that entirely eliminates the annoying springs, brass seats and ball checks commonly used in other Air Compressors.

OUTSTANDING QUALITY makes the Champion pre-eminent in the fine Compressor class. It will give you the most constant year round service.



To obtain a maximum return in the form of good will, you must have an equipment that will give rapid, reliable service under all conditions—The CHAMPION does this.

With the above facts in view, the CHAMPION AIR COMPRESSOR should appeal to you strongly.

10 EXCLUSIVE MECHANICAL FEATURES:

1. Annular Ball Bearing Crankshaft.
2. Cylinders and Valve Heads Cast Integral.
3. Pressure release Automatically releases oil and water from base of Compressor.
4. Connecting Rod Bearing, Bronze Back Babbitt Lined.
5. Mushroom valves in Bronze Cages. (Special arrangement for regrinding)
6. Removable Cylinders easy for inspection.
7. Fan Blade Fly Wheel.
8. Drop Forged Crankshaft.
9. Hollow wrist pin, hardened and ground, securely fastened in piston.
10. All parts standard and interchangeable.



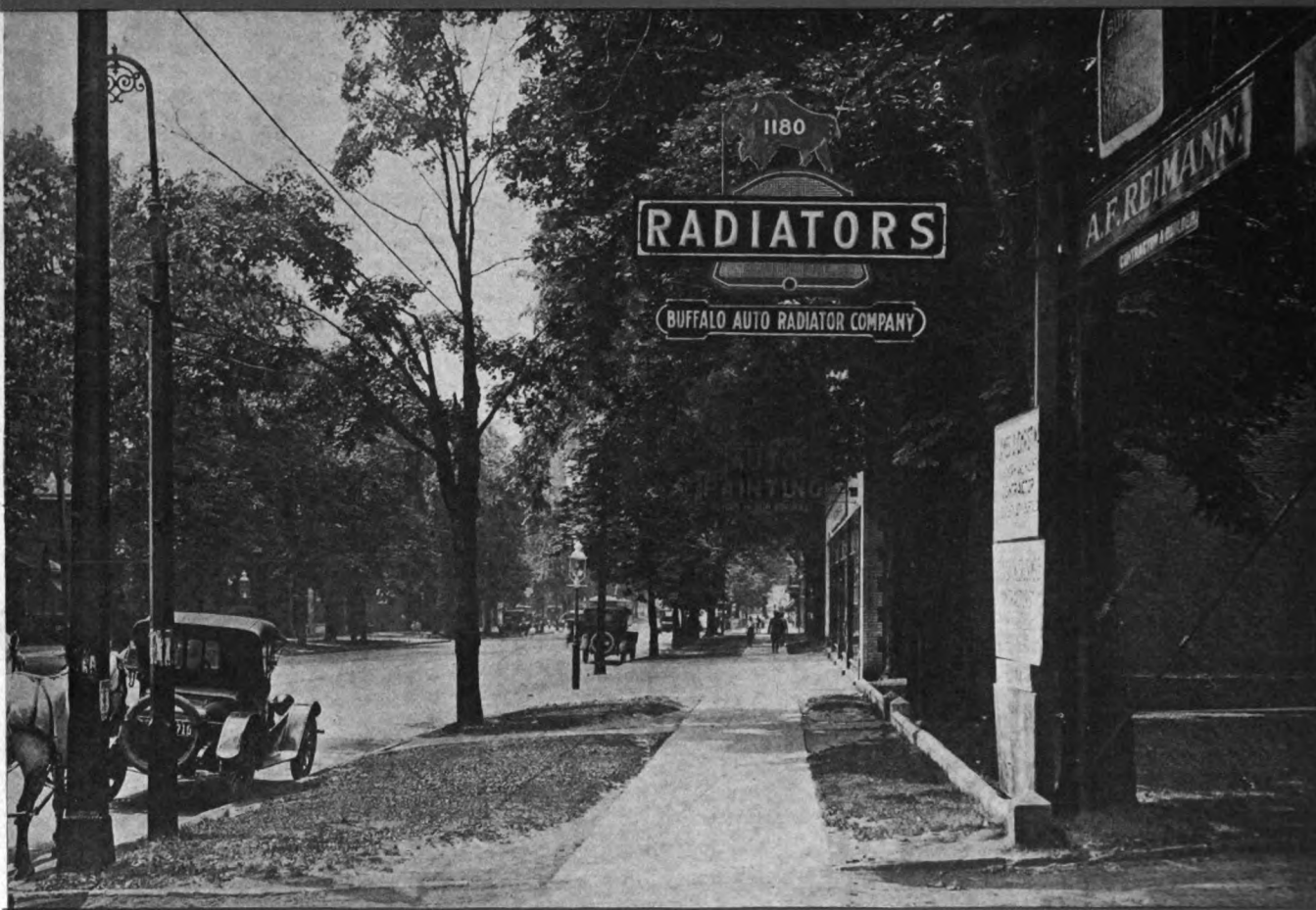
**The Champion Pneumatic
Machinery Co.**

*Manufacturers of the most complete
High Grade AIR LINE SPECIALTIES*

1402 S. Michigan Ave.

CHICAGO





An Oplex Sign isn't an Expense—It Means Profit

"Tell them it isn't that they can't afford an Oplex Sign—they can't afford to do without it."

That's what one auto and accessory dealer said. He uses one himself. Experience has taught him that an Oplex Sign reaches out into the night and pulls in business.

In the daytime it is on the job too—raised white letters on a dark background. No other sign can give you this same distinctiveness, this same 24-hour service.

You need an Oplex Sign.

Just tell us about your particular requirements and we shall be glad to send you a sketch showing how your sign will look.

THE FLEXLUME SIGN CO.

1334 - 38 Niagara Street
BUFFALO, N.Y.

Pacific Coast Distributors:
Electric Products Corp., Los Angeles, Cal.

Canadian Distributors:
The Flexlume Sign Co. Ltd. Toronto, Can

American Garage & Auto Dealer

Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

AUGUST 1919

Vol. 10—No. 8
10 Cents the Copy
\$1.00 Per Year



“—saves two-thirds of my Tire Expense

“Once a week I go over my tires—and seal the little holes and cuts that ruin tires by permitting dirt, oil and water to reach and rot fabric. With the SHALER Vul-Kit I ‘vulcanize’ these holes with tough, new rubber that makes a lasting job of it. It takes only a few minutes—but keeps my tires good as new—prevents tire trouble—*doubles* my mileage—and actually saves two-thirds of my tire expense.”

Sell the SHALER VUL-KIT

It's easy to sell. Motorists are looking for a tire-saver like this. Their word-of-mouth endorsement of the SHALER to their friends gives you a chain of sales. The repair material they buy of you to use with this vulcanizer gives you “repeat” profits that come to you regularly—without effort. You make a good profit selling the Vul-Kit itself and big, steady “repeat sale” profits.

SHALER Vulcanizers are advertised regularly throughout the year. Motorists are now reading the large, dominant advertisements in the leading national and motorist publications. Every car-owner needs a SHALER Vul-Kit—sell it to him and make these big steady profits for yourself. **Complete Outfit only \$3.50.** Price slightly higher west of the Rockies and in Canada.

Order From Your Jobber Now—Write Us for Catalog
of the complete line of SHALER Vulcanizers for garages, tire repair shops and motorists' use

C. A. SHALER CO., 357 Fourth Street, Waupun, Wisconsin

Oldest and Largest Manufacturers of Vulcanizers in the World



**Here-
see the sign!**

The sign that stands for piston ring
efficiency to motorists everywhere.

The *Spiral cut* of the Inland One-Piece Piston
ring has demonstrated its supremacy over
any other form of piston ring construction.

And this exclusive Inland patented feature gives advantages in
motor operation that cannot be duplicated in any other ring.

No gap.

Uncoils in a perfect circle.

Gas-tight contact all around.

Equal breadth and thickness at all points.

These superiorities result
in greater power on less
fuel and oil.

And the Inland not only saves motor
operating cost, but is itself a great econ-
omy. For the Inland process of heat
treatment produces a ring of uniform
structure throughout, that *wears evenly*
all around—*maintaining* the gas-tight
contact with cylinder walls.

Jobbers everywhere stock Inlands

Inlands are for every type of internal combustion
motors—automobiles, trucks, tractors,
stationary engines, and marine engines.

Inland Machine Works,

1645 Locust Street,
St. Louis, Mo.

Dealers—Are you getting
All the Selling Advantages
that also are *Exclusive*
Inland trade assets?

Is your stock of Inlands complete? Are
you displaying Inland Window and
Store Signs? Are you distributing Inland
literature? Are you pushing Inland sales?
All these will help your business to grow
and profit greater.

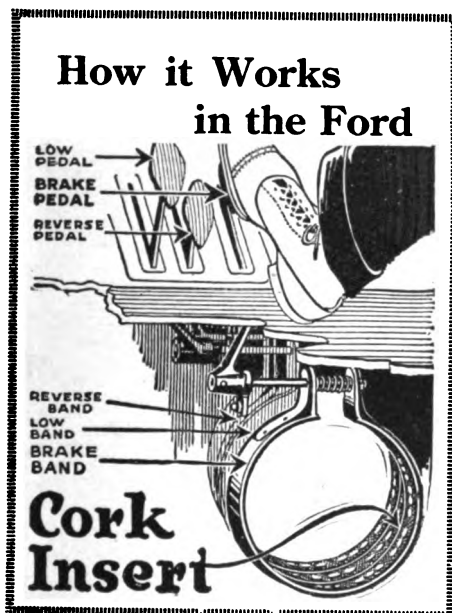


*\$3 per set of three
Rockies West, \$3.25
Canadian Price, \$4.50*



They are the Best Ford Transmission Linings

Cork Insert Transmission Linings



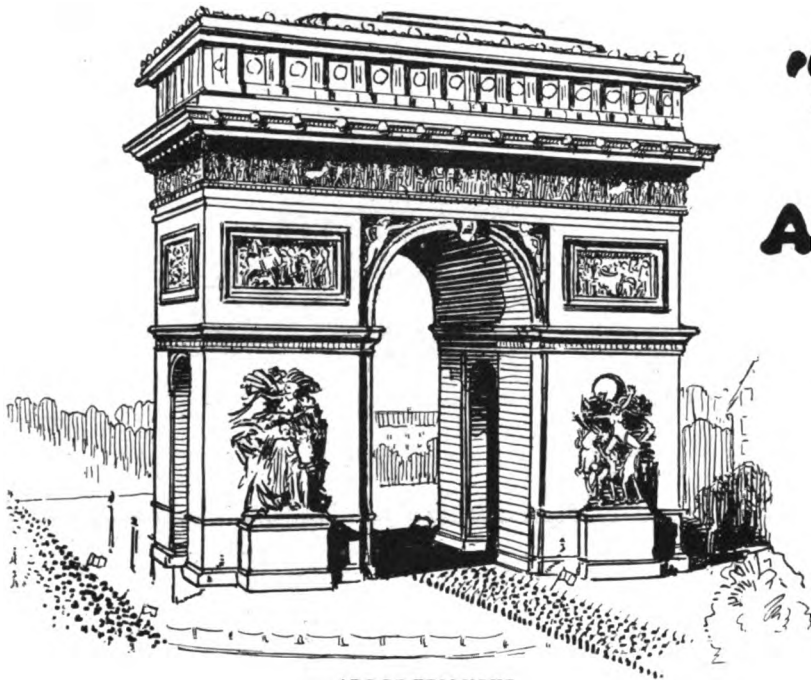
- take hold with a sure, smooth grip
- requires little pressure on the pedal
- make the brake safe
- stop vibration and stuttering
- save the Ford rear end
- give greater pulling power on low
- wear so long they're cheapest in the long run.

*Be sure you get
Advance Cork Insert Linings*

Your garageman or repairman sells and installs Advance Cork Insert Linings. All wholesale houses handle them.

**Over a million sets
have been sold in
only two years.**

**Advance Automobile Accessories Corporation
Dept. H7, 56 E. Randolph St., Chicago**



ARC DE TRIOMPHE

This is the triumphal arch at Paris, France, which is the largest in the world—being 162 feet high by 47 feet wide, and commemorates the triumphs of the Revolutionary and Napoleonic troops. It was under this arch that France and her allies celebrated the Victory of the world-wide war.

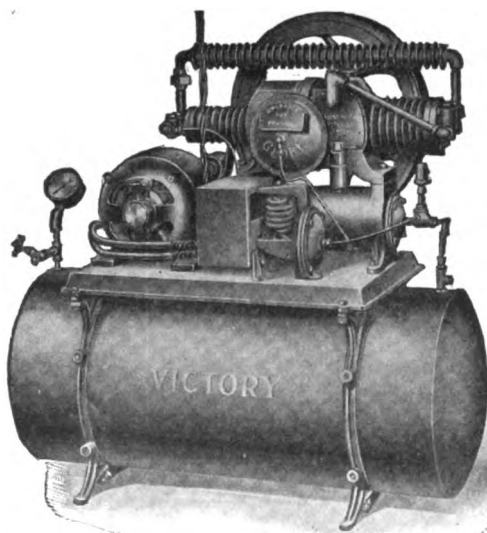
"VICTORY" AIR COMPRESSORS

should
also receive
your
recognition
this year

BASTILLE Day in France, July 14th, was a great day. It was a day of victory, in which the entire nation, as well as her allies, participated. France had a right to take just pride in the exploits of her soldiers.

And so, too, it is appropriate that we should name our new automatic air compressor unit the "Victory" Air Compressors, not only because they were perfected by us at a time when victory in the world war was in the winning, but because our engineers had really determined that the new model Globe Air Compressors were to be so progressive and successful in design and operation, that they could be fittingly called the VICTORY.

All GLOBE Air Compressors, including the new VICTORY models, are made on the two-stage principle, which has proved the most practicable for garage duty. As we make

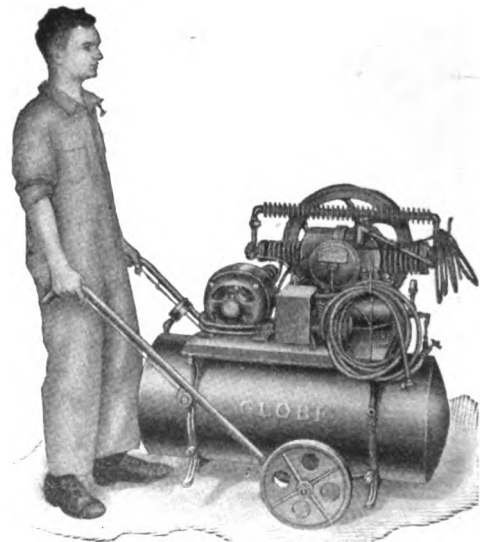


The "Victory" Complete Motor Drive Compressor Unit

substantially mounted on steel air storage tank, making the most compact, attractive and serviceable Automatic Air Equipment. Unequaled for free air stations.

a complete and varied line of air compressors, there is bound to be a Globe outfit which will especially suit your requirements. A postcard or letter will bring literature immediately.

**Globe
Mfg.
Company**
**BATTLE CREEK
MICH.**



The "Victory Portable"

Same as the Victory, but is provided with truck attachment. When not being moved, is virtually a stationary equipment resting securely on four feet.

Nearly a Million Feet of

White Stripe

Have Been Sold in Ten Months



Specially made for Ford transmissions

Why is White Stripe the most successful plain fabric transmission linings?

It is woven after a pattern designed specially for friction wear. No other lining is woven like it. Ours are the only looms that will produce the White Stripe weave. We first designed the White Stripe weave and then built our looms to produce this weave.

The White Stripe process of treating this special friction weave was designed by chemists who first determined the actual service conditions in the Ford Transmission.

The treatment in all ordinary transmission linings is of little value, because it is immediately washed out of the linings by the hot oil and residue from unburned fuel. That is the reason for the special White Stripe treatment. It stays in the linings—protects it from the heat and friction—it has great wearing and friction value in itself.

It is very easy to understand why White Stripe is rapidly replacing all other plain Ford transmission linings. From start to finish it is made especially for Ford Service.

Every inch bears the famous White Stripe.

The best dealers recommend White Stripe; all jobbers handle it

Advance Automobile Accessories Corp.
Dept. H-7, 56 East Randolph Street, Chicago



In boxes

\$2 per set of three
Rockies West, \$2.25
Canada, \$3.00

In rolls

32 cents per foot
Rockies West, 35c
Canada, 40c

"NORMA" PRECISION BALL BEARINGS

(PATENTED)



Out of after-the-war conditions, some words are emerging with new and trenchant meanings—among them, "value" and "service" and "price." American machine builders and buyers know today as never before that value must be measured by service, not by price. Any other standard is a false one, sure to lead to disappointment.

The cars, trucks, tractors and power boats that today are commanding the market on service rather than on price, carry "NORMA" equipped magnetos and lighting generators. Which simply confirms the statement repeatedly made in this space, that "NORMA" Bearings are an identifying feature of high-duty, large-service automotive units.

**Be Sure—See That Your
Electrical Apparatus
Is "NORMA" Equipped.**



THE NORMA COMPANY OF AMERICA
1790 BROADWAY NEW YORK

Ball, Roller, Thrust and Combination Bearings

American Garage & Auto Dealer

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|---|------|
| Truck Chassis Tax Reduced After Big Association Protests | 9 |
| Automotive Dealers Should Plan to Sell More Tractors Both City and Farm Would Benefit by National Road System | 9-11 |
| Profit Chances in Fitting Cars for Vacation Trips | 11 |
| Stop Customers' Talk in Repair Shops and Save Profits | 11 |

GENERAL

| | |
|--|----------|
| You Must Be Properly Equipped! | 10 |
| Truck Tax Is Cut to Three Per Cent | 12 |
| Types of Motor Vehicles to Be Retained by Army | 12-13 |
| Vehicle or Accessory Sales to States Are Now Taxable Bureau of Public Roads Tests Surface Impact of Trucks | 13 |
| Louisiana-Mississippi Tradesmen Organize an Association | 13 |
| Trucks on Tour to Convert Farmers | 14 |
| Workman's Rights in Case of Injury, by Chesla C. Sherlock | 16-16 |
| Mud Delays the Army Truck Convoy | 16-17-18 |
| Workers Travel by Motor Vehicle, by Arthur W. Park | 18-19 |
| Need of Motor Club in Small Town, by C. M. Adams | 19-20 |
| Tentative Chart of Accounts Set Up, by J. Newton Boddy | 21-24 |
| Showcase Display Brings Profits | 22 |
| Motor Truck Transport Grows Fast, by N. H. Cartin-hour | 23-24 |
| Truck Executive Favors Building Heavy Duty Highways | 24 |
| Army Road Equipment to Be Used in Federal Highway Work | 24 |
| Women Do Welding on N-C Fliers | 26-27 |
| "Trade-In" Trucks Dealers' Problem, by R. F. Moore | 27 |
| The Squeak and Rattle Man, by C. M. Adams | 29 |
| Has Vacation Car for Hunting Trip, by L. C. Blake | 31-34 |
| Advocates Federal Car Theft Law, by H. C. Bradfield | 38 |
| Favors Commission to Build Roads, by Dr. H. M. Rowe | 50 |
| Penlings from the Pen of Dike, by C. H. Woden | 50 |
| Needs of Compressed Air Service, by A. B. Jenkins | 52-54 |
| Quantity Production of Stewart Wire Wheels Is Started | 54 |
| Jenkins Company Keeps Reserve Stock of 100,000 Springs | 58-60 |

DEPARTMENTS

| | |
|--|-------|
| Welding, Cutting and Brazing Practice, by David Baxter | 28-29 |
| How to Make the Shop Profitable, by E. B. Hinrichsen | 30 |
| Practical Hints for Shop Mechanics, by G. L. Shelley | 32-34 |
| Readers' Questions and Answers, by G. L. Shelley | 42-44 |
| Accessories—They Bring in Money | 48 |
| News of Manufacturers and Jobbers | 56 |
| Facts and Ideas in the Tire World | 60 |
| Accessories and Garage Equipment | 64 |
| Buyers' Reference | 76 |
| Index to Advertisers | 77 |

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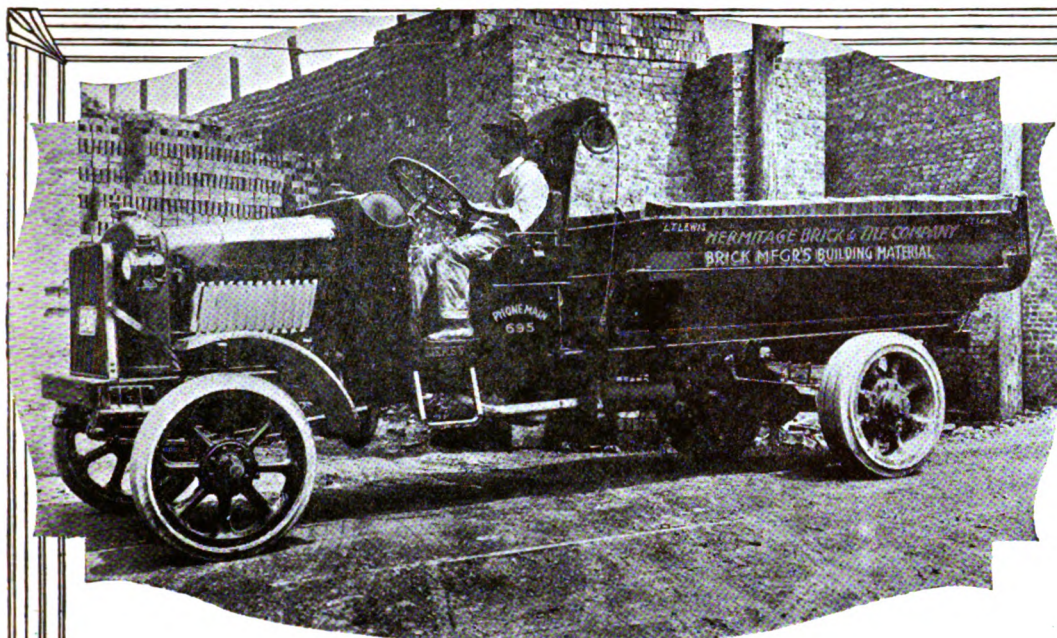
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The Hermitage Brick & Tile Company, of Nashville, Tennessee, finds the Denby best fitted to handling building materials.

for cheaper transportation, everywhere

DENBY MOTOR TRUCKS

In congested city traffic—on the ranches of the west—in the United States and in the out-of-the-way places of the world—everywhere, Denby trucks are giving dependable transportation at minimum cost.

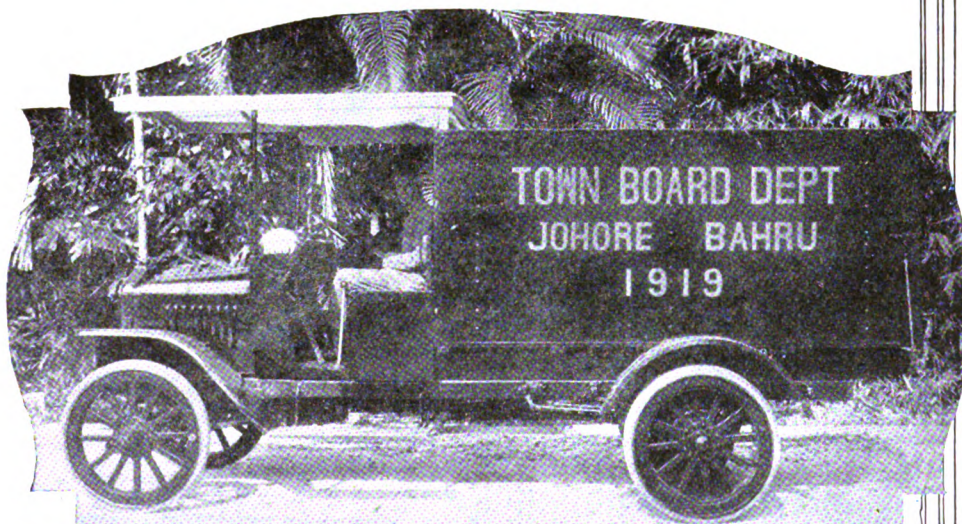
Dealers!

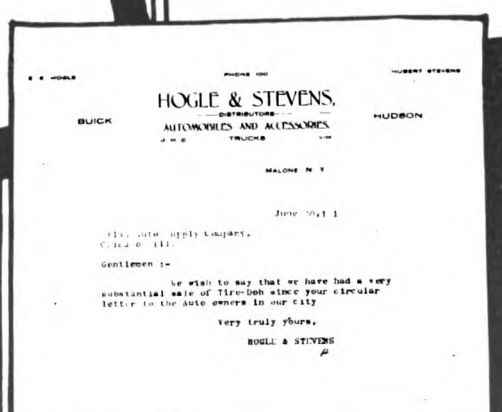
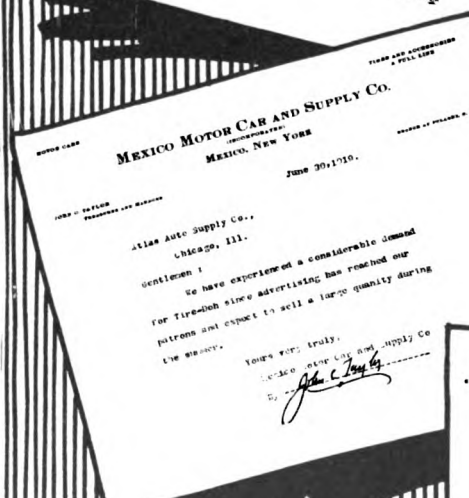
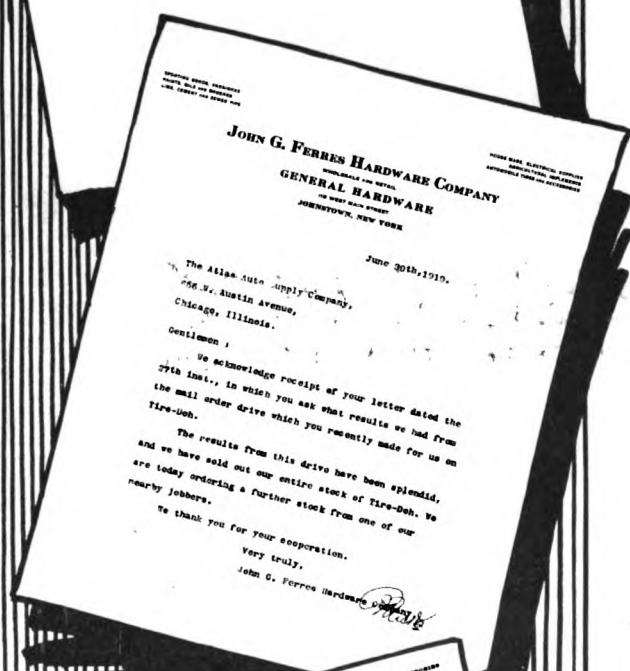
There are big opportunities in merchandising Denby trucks; maybe there's some open territory in your section. A letter to the factory will post you.

This economy, characteristic of all models of Denbys, is not the result of any one feature but comes from an efficient mechanism backed by a dependability that meets all tests,—resulting in a transportation cost, considering both purchase price and maintenance, that is surprisingly low.

Denby Motor Truck Company, Detroit

Johore Bahru is one of many towns and cities in the Straits Settlements that have adopted Denby equipment.





These letters *prove* that **TIRE-DOH** dealers keep busy

Here is first hand evidence that TIRE-DOH dealers make substantial sales.

In less than one week, the accompanying four letters were received by us from different TIRE-DOH dealers, which emphatically prove that TIRE-DOH is a popular seller.

Now this must convince you that TIRE-DOH makes an interesting dealer specialty, because TIRE-DOH never remains idle.

These and hundreds of other similar letters conclusively show that TIRE-DOH dealers find business always good.

Our selling plan is very thorough and intensive—and the co-operation we give makes for a quick turnover, assuring you of constantly good profits.

The liberality of our selling helps will surprise you.

TIRE-DOH is the standard tire repair outfit—repairs tires easily, quickly, permanently, and without vulcanizing.

If YOU are not already a TIRE-DOH dealer, do not allow another day to pass by without getting the TIRE-DOH dealer proposition.

**ATLAS AUTO
SUPPLY
COMPANY**

680 Austin Ave.
CHICAGO, ILL.

American Garage & Auto Dealer

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

Vol. X. No. 8

CHICAGO

August, 1919

Truck Chassis Tax Reduced After Big Association Protests.

Convincing proof of the benefits of a large and aggressive organization is afforded by the reduction of the truck chassis tax from five per cent to three per cent, recently announced by Treasury Department officials at Washington. When the ruling that truck chassis were to be taxed five per cent was made last Spring the officials of the National Automobile Dealers' Association at once entered a vigorous protest. The objection of the N. A. D. A. as an organization was well backed up by the unanimous opposition of the association's individual members to the ruling and the big country-wide organization has once more justified both its size and worth by the service that it rendered to all motor truck dealers, both inside and outside of its ranks.

Automotive Dealers Should Plan to Sell More Tractors.

Men who are well informed on the subject declare that there will be a far greater demand for farm tractors next year than ever before and this is one reason why automotive tradesmen who have not already done so should investigate the proposition at once. For some years to come it is certain that there will be tremendous calls upon this country for food to be shipped to various European countries. It does not seem likely that the farmers of the United States will be able to increase their present production totals to any extent with their present equipment, especially when so many of the young men who were

formerly available as agricultural laborers have decided to remain in cities since the war ended.

Some of these young men who once worked on farms formed friendships with city dwellers while in the Army here or abroad and have since gone to work in shop, office or factory with their newly-made chums. Others have gone to the cities or even to small places where there are factories because the hours of a workman in a manufacturing plant are shorter than those in vogue on farms and the wages paid much higher. It is, of course, true that living expenses are higher in the cities than on farms but the added chances of entertainment or education or social life in the cities more than compensate the young men for the higher cost of living.

Every farmer who used a tractor successfully on his farm this year was an unpaid salesman and demonstrator for the energetic automotive merchant who will strive to sell tractors to the neighbors of any man who has shown that power applied to plows, reapers and other farm apparatus earns big dividends. Farmers and their employes are rapidly becoming accustomed to the use of tractors and there are fewer accounts these days of tractor troubles than was formerly the case.

The advantages of having tractors on farms are not confined to their use in hauling apparatus in place of horses or other animals. The pulleys with which most tractors are fitted can supply power for quickly and efficiently doing a great many of the

tasks on a farm and whenever there is any scarcity of labor the power possibilities of tractors make them attractive to farmers. And there has been a scarcity of labor, which condition seems likely to continue for some time.

Economists declare that the present high cost of living can only be lowered by greatly increased production. There can be little argument over the obvious fact that the only manner in which the production of farm produce can be increased is through a more extended use of power-driven apparatus, and in the majority of cases this means the employment of more tractors. It will not be possible, perhaps, to sell many tractors for immediate use but now is the best time to start making plans to sell tractors for use next year.

Most of the agricultural colleges and those State universities that devote any attention to agricultural matters—and many of them do—would undoubtedly be willing to assist automotive dealers in their search for knowledge on the subject of tractors. These institutions accumulate a great deal of valuable information on tractors in the course of their regular work and it seems likely that their officials would be willing to pass this knowledge along to automotive merchants who would ask for it.

Both Farm and City Would Benefit by National Road System.

That it is the farmer rather than the city man who needs and will benefit most from the construction of a national highway system is brought

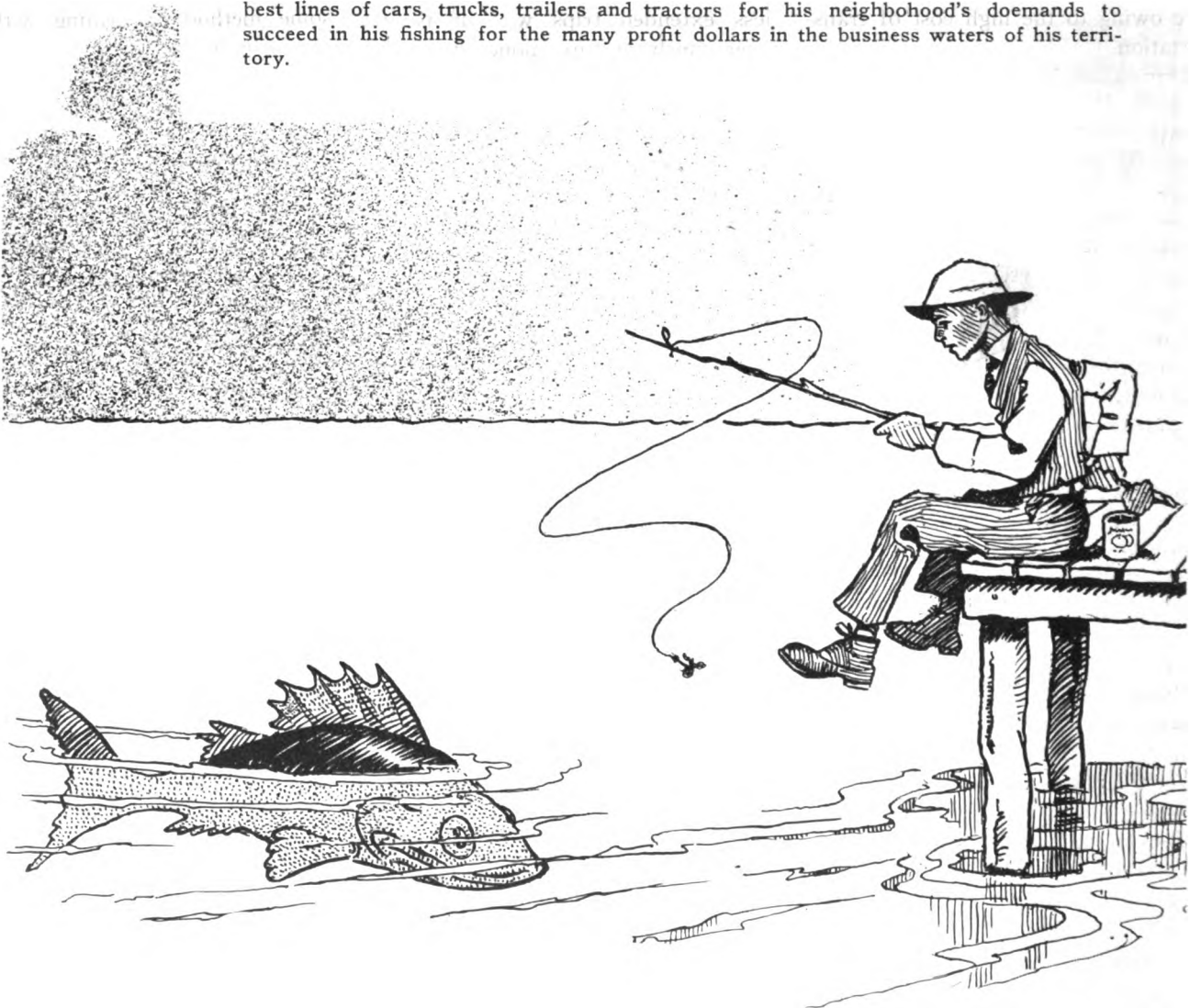
You Must Be Properly Equipped!

Proper equipment is as necessary to the man looking for retail automotive business as it is for a fisherman who wants to land "big ones." Some automotive tradesmen handicap themselves in their fishing for profits in the business stream because they are not outfitted with the right kind of inducements—or tackle—with which to catch the dollars of customers as hard to land as any other kind of fish worth going after.

Advertising in local newspapers, by circulars, personal letters or telephone calls; illuminated electric signs and well arranged window displays, in their attractions for prospective buyers, have the same relation to netting the profit dollars of business as the highly colored flies with which the fisherman brings the scaled beauties to his hook. When "business bait" is not of the most efficient type the progressive automotive merchant will at once obtain newer aids to help him bring customers into his establishment.

The true disciple of Izaak Walton not only supplies himself with attractive bait to lure the fish but has rods, lines and reels strong enough to land the fish after it has taken the bait. The automotive dealer must look to his commercial equipment. He must have air compressors, vulcanizers for tires and tubes, battery charging outfits, welding apparatus and machines for rendering service to car, truck, trailer and tractor owners in his service department.

He should be selling farm electric power plants and accessories as well as the best lines of cars, trucks, trailers and tractors for his neighborhood's demands to succeed in his fishing for the many profit dollars in the business waters of his territory.



out by some figures in a recent announcement made by an official of the American Automobile Association. He calls attention to the fact that American makers have contracted for materials with which to produce 2,000,000 automobiles in 1919. He goes on to tell that the American farmer has thus far bought more than 70 per cent of the automobiles produced this year.

It may be that the city man, with his purchase of less than 30 per cent of the 1919 output, will think that the good road question is no concern of his. Most city streets are paved or improved in some manner and there are a fair number of good highways to and from most of the larger cities of the country. But the city man has a very real interest in better country highways because all of the food that must be transported over bad roads takes longer to reach the consumer in the city, and of course is more expensive owing to the high cost of transportation.

During the war rural motor express lines helped greatly by rapid and cheaper hauling of farm products into cities, the food reaching the consumer much quicker than had been the case when horses drew the farm products to the freight houses of railroads, from where it was taken to city freight houses, again to be loaded into a horse drawn wagon to be taken to the dealer's store or warehouse. Men who have taken an interest in the formation of rural motor express lines in different parts of the country unite in saying that the greatest obstacle to the wider spread of these lines is the lack of improved roads in so many sections of the country.

Districts where rural motor express lines can be successfully operated over good roads are not so likely to be bothered by high food prices as those regions where the roads are so bad that it is impossible to conduct rural motor express lines.

The farmers both as individuals and through their organizations are working for good roads, and city men should help in every way possible. One of the best ways for all classes of citizens to help the cause of good roads is for them to write letters to their Congressmen and United States

Senators asking them to support the Townsend bill for the national highway system now under consideration at Washington.

Profit Chances in Fitting Cars for Vacation Trips.

Automotive dealers who are alert to their opportunities can often make good profits and help their regular customers in an unusual manner by fitting up cars for vacation trips. While perhaps there are not many dealers who would feel like keeping camping equipment in stock they might obtain from their jobbers quotations of some of the more simple fittings that could be used by motorists who wished to go touring without being forced to spend their nights at hotels. Small tents and cot beds, cooking apparatus, bottles for carrying hot or cold liquids serve as the means by which an ever-growing number of car owners make more or less extended trips without paying over much or any money to hotel-keepers. While there are not many motorists who feel able to make the elaborate provisions for vacation described in an article on another page there are thousands who only need a suggestion from a dealer to buy through him the simpler equipment that would permit them to tour wherever their cars would run without any outlay being required for hotel accommodations.

Stop Customers' Talk in Repair Shop and Save Profits.

One of the most widespread causes of loss to owners of repair shops and service stations is the habit that so many customers have formed of talking to mechanics engaged in repair or service work. This source of trouble and lost profits has long been eliminated in most of the big cities where there are strong local organizations of dealers. Many of these men are very careful students of all departments of their business, and, having discovered many years ago that the presence of customers in their repair shops was an expensive luxury, they adopted rules keeping every one but mechanics out of these parts of their establishments.

It is of course true that it is a sim-

pler matter to enforce such a rule in a big city than in a small town. In a great many of the cities the repair departments are located on upper floors of buildings so that it is necessary to use elevators or stairs to reach them, while in the majority of small towns the repair department will be located on the street floor. It is easier to keep customers out of the shop located on the upper floor than it is to prevent them from walking into a shop that adjoins an office or a sales-room.

The fact that city dealers as a rule are members of local trade associations has always helped them in their efforts to run their repair departments with the idea of making money rather than affording a lounging place for customers. The big city trade bodies have fairly frequent and well attended meetings when various matters of interest are considered. After these problems have been discussed and some method of dealing with them has been devised the solution is generally effective because it is backed up by united action on the part of all association members.

One of the greatest handicaps that small town dealers have been suffering has been their lack of united action. In cities and towns that had from three to four to 40 or 50 members of the retail automotive trade, the men have known each other but have seldom realized the benefits that would follow the formation of a local trade association.

Three or four or a dozen dealers in a town who are selling motor vehicles or accessories or repairing them can form a trade association of their own.

In small places where trade bodies have been organized, one of the immediate benefits has been that it has been possible to adopt a standard set of prices for used cars and trucks, as well as rules for the conduct of service stations and repair shops. Even if half a dozen owners of repair shops and service stations form a local trade organization with no other purpose in mind than to make an agreement that each member would enforce a rule to keep all customers out of his repair shop, the effort and time needed to get together would earn big dividends.

Truck Tax Is Cut to Three Per Cent

Treasury Department Reverses Its Former Ruling that a Truck Chassis Is Taxable at Five Per Cent as a Part, Following Protests Registered by the National Automobile Dealers' Association Board of Directors in May

Efforts which the National Automobile Dealers' Association have made to have a truck chassis carry a three per cent tax instead of a five per cent tax have been successful. The Treasury Department in ruling revising previous rulings has in effect authorized the assessment of a three per cent tax on chasses and reversed the former ruling that a chassis is a part and taxable at five per cent.

The new ruling contained in Treasury Decision No. 2893 is as follows:

"Definition of chassis and parts: The last two sentences of Article 15. Regulations 47 modified by T. D. No. 2852 are hereby further modified to read as follows:

"A chassis provided with a superstructure of such design that it is without substantial additions adaptable for hauling heavy loads is an 'automobile truck,' or 'automobile wagon,' and taxable at the rate of three per cent when sold by the manufacturer thereof. A chassis NOT so equipped is an 'other automobile,' or a 'part' taxable at the rate of five per cent when sold by the manufacturer thereof, unless (1) the manufacturer has actual knowledge from the construction of the chassis which he sells that it is to be used as an automobile truck or automobile wagon, or has in his possession at the time the chassis is shipped or sold, (whichever is prior), an order or contract of sale with a certificate of the purchaser in writing printed thereon or permanently attached thereto, showing that

the chassis specified in the order is to be used, in which case the chassis will be taxable at the rate of three per cent when sold by the manufacturer thereof."

When regulations 47 were handed down in May the dealers' association made a strong protest to the revenue department over classing a chassis as a "part," or as an "other automobile" taxed at five per cent.

As a result of protest the Treasury Department handed down a decision

The present modification is interpreted to mean that if you can look at a truck chassis and tell that it is to be used as a truck for hauling property it bears a three per cent tax. This ruling means that the only case where a five per cent tax applies to a truck chassis is where a bus body used for hauling passengers is attached.

Types of Motor Vehicles to Be Retained by Army.

Fears of some car dealers that the

war department would sell a lot of automobiles to the general public and upset their business should be quieted by a recent official announcement on the subject. In a bulletin to members sent out by General Manager Alfred Reeves of the National Automobile Chamber of Commerce, there is a list of the types of motor vehicles, both passenger and truck, that are to



Officers and Directors, National Automobile Dealers' Association at Meeting in St. Louis. (Left to right around table) C. A. Vane, Assistant Business Manager, St. Louis; A. E. Maltby, Director, Philadelphia; George D. McCutcheon, Director, Atlanta; P. H. Greer, Director, Los Angeles; H. G. Mook, Business Manager, St. Louis; P. E. Chamberlain, Director, Denver; P. H. Brockman, President of St. Louis Automobile Manufacturers and Dealers' Association; Harry D. Austin, Second Vice-President, Seattle; H. L. Robertson, Director, Houston; F. W. A. Vesper, President, St. Louis; W. J. Brace, Director, Kansas City; J. A. Graham, Director, Minneapolis; A. E. Mitzel, Director, Canton, O.; John Bos, Member St. Louis Automobile Manufacturers and Dealers' Association; E. W. Steinhart, First Vice-President, Indianapolis, and B. B. Hudnall, Office Manager, St. Louis.

June 3, declaring that when a chassis bore a superstructure of such design that it is without substantial additions adaptable for hauling heavy loads "an automobile truck or automobile wagon."

The board of directors of the dealer organization was in session at St. Louis at the time and immediate protest was telegraphed to Washington that the truck chassis is the unit of a truck sale and that if the ruling, requiring a body on every chassis, were adhered to, not one truck in 300 would be eligible for the three per cent tax.

be kept by the war department.

The bulletin states that Brigadier General Drake, Motor Transport Corps, announces that the following types of trucks and passenger automobiles will be retained by the army:

Type 1: Passenger Cars: Medium, open, Dodge; Medium closed, Dodge; Heavy, open, Cadillac; Heavy, closed, Cadillac.

"Type 2: Light Delivery Truck: 1½ Ton Light Delivery, Dodge; ¾ Ton, White; ¾ Ton G. M. C.; 1 ton, White, Tebo.

"Type 3: 1½ and 2 Ton Trucks: White, Garford, Packard.

"Type 4: 3 and 4 Ton Trucks; Standardized "B"; Riker; Mack, 3½ Ton Trucks; F. W. D.

"Type 5: Five Ton Trucks, or Over; Mack, 5½ Ton Trucks; Mack, Special Engineer.

"Type 6: Ambulances; G. M. C.

"None of these machines will be placed in the surplus equipment. The statement says specifically that these cars are not placed as Army standards at the present time."

Vehicle or Accessory Sales to States Are Now Taxable.

In an announcement mailed August 1 by General Manager Alfred Reeves of the National Automobile Chamber of Commerce to members of that organization it is said that sales of motor vehicles or accessories to States are now taxable. Mr. Reeves' announcement was, in part, as follows:

"This means that every sale of an automobile or truck to any of the States or political subdivisions thereof made since Oct. 3, 1917, is now held to be taxable, and every sale of a tire, inner tube, part or accessory made since February 25, 1918, to any of the States or political subdivisions thereof is taxable.

"This in spite of the fact that Regulation 44 approved May 31, 1918, by the Commissioner of Internal Revenue provided that under the Act of 1917 such articles sold to a State or political subdivision thereof were not taxed, and in spite of the fact that the unofficial advice of the Revenue Bureau from February to May, 1919, was to the effect that neither sales to the Government nor to the States would be taxed under the present law, and in spite of the fact that Regulation 47 approved May 1, 1919, interpreting the present law, while holding that sales to the Government were taxable, confirmed the understanding that sales to the States or political subdivisions thereof were tax free.

"The Bureau has given no intimation until the issuance on July 30 of T. D. 2897 that any change in the situation was contemplated. In fact, your general manager personally called upon officials of the Revenue Bureau in Washington yesterday and these officials gave no intimation that

this T. D. was contemplated, although it was approved by the Secretary of the Treasury on July 22 and is based on an opinion of the Attorney-general of the United States dated July 7.

"While we believe this retroactive regulation is of doubtful legality, and surely is an injustice to the taxpayers, it has the approval of the highest executive law officer of the Government, so there is nothing for the tax payers to do at present but pay the tax under protest. This retroactive feature imposes a particular hardship as it affects not only sales under the present law, but also sales under the prior law. There is no possibility of the taxpayer passing the burden on to the consumer."

Bureau of Public Roads Tests Surface Impact of Trucks

The increasing use of motor trucks has drawn the attention of highway engineers to the urgent need of determining what kind or kinds of road material will wear longest under present and future conditions. Some of the experiments being conducted by the government along these lines are described by Pyke Johnson, secretary of the highways committee of the National Automobile Chamber of Commerce, in the following bulletin recently issued:

"Preliminary road impact tests made by the Bureau of Public Roads indicate that the pressure exerted by a motor truck in motion is about six times that of a truck at rest. These tests were conducted with a Class B Government truck loaded up to five tons, running up to 15 miles an hour and allowed to fall from varying heights on the impact measuring apparatus. These tests will be continued with trucks ranging from the lightest weight to the heaviest until complete data is obtained.

"The question of the relative impact exerted by trucks with solid versus giant pneumatic tires will also be investigated. Definite arrangements have been made to obtain a Packard three-ton truck with requisite tire equipment for these tests and a loan of other units would be welcomed by the Government officials.

"Tests to show the resistance of

various types of road surface such as concrete, asphalt, etc., are soon to be undertaken. About 50 road slabs built of these materials will be broken under the impact of a machine which approximates the impact effect delivered by motor trucks."

Louisiana - Mississippi Tradesmen Organize an Association

In a letter to the editor of this journal, C. U. McDowell, secretary and general manager of the Louisiana-Mississippi Automotive Trade Association, tells something about the new organization. Its headquarters at 712 Poydras street, New Orleans, include a large hall where meetings of the local trade association, sectional organizations and the Louisiana-Mississippi body are held. Mr. McDowell's telling of the plans was, in part, as follows:

"The Louisiana-Mississippi Automotive Trade Association has been organized for the purpose of upbuilding in every possible way the automotive industry in the South. Our activities will include legislation, good roads, education of the dealers, honesty in business affairs and along general lines.

"We will have an information bureau where data may be obtained concerning any phase of the industry in the South, and where publicity matters will be sent to all the leading publications in this section who have pledged their support to this organization."

The other officers of the body are: President, George D. Wray, Shreveport; vice-presidents: A. H. Borden, New Orleans; Ginder Abbott, New Orleans; T. L. Huber, Lake Charles, La., and M. R. Adams, Meridan, Miss.; directors: R. E. Hines, Jackson, Miss.; L. C. Glenn, New Orleans; W. A. Chichester, Jackson, Miss.; A. C. Wilkins, Jennings, La.; James D. Cathey, New Orleans; J. K. Dunn, McComb, Miss.; Philip Hirsch, Alexandria, La.; Percy Stern, New Orleans; J. H. Hooks, Clarksdale, Miss.; E. D. Kimbrough, Greenwood, Miss.; Reuben H. Brown, Jeanerette, La.; L. E. Barr, Lexington, Miss.; W. H. Daniels, Gulfport, Miss., and Fred Perkins, New Orleans.

Trucks on Tour to Convert Farmers

Seventeen Commercial Motor Vehicles, All Shod With Pneumatic Tires, Start Journey of 3,000 Miles Through Six States to Demonstrate Uses to Which They Can Be Readily Adapted to Help in Daily Work of Food Production

With every wheel running on pneumatic tires, a fleet of 17 motor trucks started from Grant Park, Chicago, August 4, on a 3,000-mile tour through six different states: Illinois, Iowa, North and South Dakota, Minnesota, and Wisconsin. The route will take them through 80 of the most important cities and towns in these states where stops will be made for the purpose of giving demonstrations and addresses.

Farmers' meetings have been arranged for in advance and representatives of the U. S. Department of Agriculture, state universities, city and county officials, commercial and civic organizations have promised to help make the tour a success by hearty co-operation.

In the smaller towns stops will be made towards evening and after a musical program furnished by a naval band, addresses and demonstrations will be given. In the larger cities an entire day will be spent, the trucks will go into plowed fields and haul grain from the thresher to the barn or elevator. Produce will be carried to town free of charge to show how efficiently it can be done, and any and every kind of work will be performed to demonstrate the adaptability of the truck on the farm.

The purpose of this tour is not to establish an endurance or speed record, but entirely a business proposition. There is no competition, all the manufacturers sending trucks on this tour are co-operating to show the farmers the varied uses to which a truck can be put and its efficiency in performing such tasks.

With farm help hard to get and the demand for greater production daily increasing, in order to feed not only our own people but starving Europe as well, it becomes evident more than ever that mechanical means must be introduced to speed up production.

Few farmers will argue against the value of the motor truck on the farm but many have been hesitating on account of their lack of knowledge as to size, power, body, and equipment. The farmer is willing but in the absence of sufficient instruction and demonstration he has been postponing his decision.

The manufacturers, realizing that they have not given the attention to the farmers that they should rightly have, and realizing the necessity of increased production, decided to send their trucks right out to the farms. They plan to show the farmer the variety of work which their trucks can do and how much more efficiently and economically it can be performed than with horses.

Every truck which left Chicago being equipped with pneumatic tires has the advantage over those fitted with solid tires in the increased operating efficiency and saving. Pneumatic tires increase the life of the truck, enable it to negotiate mud, sand, and snow, off and on the road where solid tires would not. They permit increased speeds and their cushioning effect is of great importance in the transportation of certain merchandise.

One of the trucks is equipped with a countershaft fastened on one side of the hood and driven by means of a chain from a gear fastened to the crank shaft. The countershaft is equipped with two pulleys for driving farm equipment. The rear wheels also have special designed hubs which can be used for transmitting power.

Cream separators, ensilage cutters, corn huskers, pumps, in fact, any farm equipment will be connected to the engines and operated.

Another truck is equipped with a complete farm lighting plant which will furnish the light for the speak-

er's stand and current to project motion pictures.

The trucks will perform any and every task and under the condition which the farmer must contend with either on the farm or on the road. In other words, the builders of these trucks will not only proclaim the value of their products but prove their sturdiness and worth by actual demonstration. Thus they hope to eliminate any fear that may still rest in the minds of the farmers that the motor truck is not a sound, economical investment.

The run is being conducted under the auspices of the recently organized National Association of Truck Sales Managers, and individual advertising of any particular truck is forbidden.

The following trucks started on the tour: Atterbury, 2 ton, Atlas, $\frac{3}{4}$ ton, Bethlehem, $1\frac{1}{2}$ ton, Clydesdale, $1\frac{1}{2}$ ton, Diamond T, $1\frac{1}{2}$ ton, Gramm-Bernstein, 2 ton, Master Junior, $1\frac{1}{2}$ ton, Maxwell, $\frac{3}{4}$ ton, Republic, $2\frac{1}{2}$ ton, Sterling, $2\frac{1}{2}$ ton, Selden Special, $1\frac{1}{2}$ ton, Signal, 1 ton, Service, $1\frac{1}{2}$ ton, Winther Marwin, $1\frac{1}{2}$ ton, Diamond T, gasoline tank truck, Selden, service truck, and Master Junior, service truck.

Strong Argument for National Highway System.

"Did you know that there are some 7,000,000 automobiles in the world?" inquires Chairman A. G. Batchelder of the American Automobile Association's Executive Committee. "That of these more than 6,000,000 are in the United States? That American makers have contracted material for a 2,000,000 production in 1919?"

"AND

"That of the 1919 output the American farmer has bought thus far more than 70 per cent of the car production and that he will pay 60 per cent of the total cost?"

Workman's Rights in Case of Injury

Bookkeeper Who Liked to Get Out Into Shop When Not Busy at His Desk, Tries to Hurry Work on a Balky Engine and Is Badly Hurt—He Cannot Recover Compensation as He Was Not Hired as Repairman

By Chesla C. Sherlock

Frank Jones was employed as bookkeeper up in the "head office" of the Sanderson Garage. It was his business to keep the firm accounts, answer the telephone, take orders and handle visitors in the absence of any of the firm members.

But Frank was not entirely in love with his job; he liked the work, the surroundings and his employers, but his heart was out in the repair shop on the other side of the glazed glass partition. His heart throbbed with the machinery there.

Is it little wonder, then, that Frank spent as much time as he could out in the repair shop and in the assembling department. He watched with keen interest what was being done, learning a little at a time the work in which he had the greatest interest?

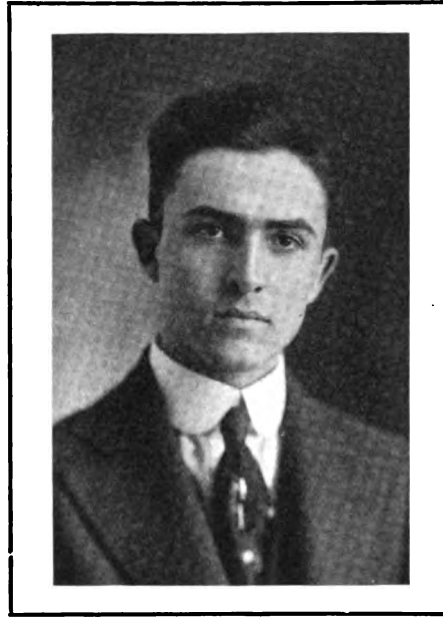
And is it unusual that during one of the rush periods that Frank, having his day's posting out of the way, should grab up a bit of tools and go to work on a balky engine?

Well, Frank did do that very thing and he sustained an injury which partially incapacitated him for life. This was partly because the work was new to him and he did not proceed as cautiously as he might, and partly because his unpracticed hands were clumsy in doing what would not have been a dangerous undertaking for a thoroughly seasoned repairman.

Frank's employer was carrying insurance under the workmen's compensation act, which act provided insurance for any of his workmen who were injured in any way by accidents arising out of and in the course of their employment.

So when Frank was taken home, helpless, the Boss got out his policy, made sure that it "covered" workmen engaged in "hazardous occupations," then started for Frank's house.

"Guess Frank is entitled to compensation all right," he said, "work-



Industrial Law Expert, Chesla C. Sherlock, Explains Rights of Injured Employees.

ing with heavy tools around a balky engine ought to be hazardous, if there is any hazardous work in a garage."

As soon as he got into the room

take care of you now. I'll see to it, so just you close your eyes and quit worrying and get well!"

In a few days, the insurance adjuster dropped off the train down at the station and sauntered up town in the direction of the Sanderson garage.

He made a few inquiries on the way, learning all about the accident, about Frank and his relation to the company. He found people anxious to answer his questions, because they thought it might help Frank get the money that was coming to him. So they told him the whole truth without varnish or embellishment.

The adjuster talked a few minutes with the Boss, went out to the repair room, saw the place where the accident had occurred, how it happened, all the details.

He said little or nothing, merely nodding his head now and then. Finally, he handed the Boss a cigar and put his pad and pencil in his pocket.

"Just time to get the train," he explained. "You'll hear from the home office in a few days."

The Boss nodded, smiled and went back to work. That sounded good; Frank would get a nice little check when that letter came from the home office.

A few days later a letter came, which read:

"Dear Sir:

"In regard to the matter of Frank Jones, injured bookkeeper in your employ, we regret to say that we must decline liability for this claim.

"Mr. Jones was employed by you as a bookkeeper and was not even covered in the premium returns on your policy.

Employees in clerical positions are not entitled to compensation under the law, hence we did not and could not charge you a premium upon his risk.

"Mr. Jones, therefore, went outside the course of his employment

For the last year and a half Chelsea C. Sherlock has devoted his entire time to industrial law research and writing. In this space of time he has written some 750 articles on industrial law.

He was born in 1895 and after graduating from the Law College of Drake University he practiced at his profession for about one year, when he was appointed secretary of the Industrial Commission of Iowa. He is the author of "Sherlock's Pocket Lawyer" and a specialist on industrial accidents.

We have asked Mr. Sherlock to write articles on industrial law as related to the automotive industry because we feel that our readers will benefit from the experience he has had in industrial relations.

where Frank was lying, all wrapped up in bandages and cotton, he patted him on the hand, and said:

"Don't worry, Frank, old boy; I have insurance that covers you and the insurance company will have to

when he entered the repairshop and attempted to repair a defective engine. We are sorry to have to reach this decision, but the law is very clear upon this point.

"Very truly yours,

"The Hercules Insurance Co."

It is not possible to record what expressions fell from the lips of the Boss after he read this letter, and still get through the mails. At any rate, he jammed his stiff derby down over his ears and hurried across the street to Roscoe Thayer's law office.

The Boss stated the case briefly, concisely, with great emphasis. When

he finished, Roscoe leaned back in his chair and shook his head, sadly.

"The insurance company is entirely right," he said, slowly. "You did not pay a premium on Frank's work as a bookkeeper because he was not entitled to compensation under the law in that capacity.

"Frank then leaves his 'scope of employment' and enters another as a volunteer to help out in a rush period. It is a hazardous employment, and in the course of your trade and business all right, George, but remember that it does not arise out of and in the course of Frank's employment.

"Can't you see that he was a meddler there; that he really didn't have any more business in that shop than Andy Smith or any other loafer about town? The law says that a volunteer cannot recover compensation for work he was not hired to do, in case of injury. Unfortunately, Frank went snooping outside his own employment, and got hurt, and the law says that he can't hold you (which means the insurance company) liable for compensation."

There are a lot of very ambitious and over-willing "Franks" who might profit by the above point of law.

Mud Delays the Army Truck Convoy

Heavy Rain Makes Nebraska Highways So Slippery that Motor Transport Corps' Trans-Continental Train is Unable to Keep Up to Its Schedule—Governor Carey, Cavalry Troop and Cowboys Welcome Caravan at Cheyenne

Muddy roads in Nebraska were responsible for the First Army Trans-continental Motor Convoy arriving at Medicine Bow, Wyoming, August 9—just one day behind its schedule. The 70 Motor Transport Corps vehicles had such a hard time August 1 traveling over rain-soaked mud highways

ing to the schedule west of North Platte and this resulted in the convoy reaching Medicine Bow one day late. When the army motor caravan reached Cheyenne August 7—one day late—it was greeted by an old-time "Cheyenne days" celebration. The welcoming party included Governor

made the going difficult and many of the trucks skidded off into the ditches but all were hauled back without damage.

The convoy has completed more than half the distance it is to travel and the vehicles are all reported to be in fine condition. Some of the tires that were badly worn were replaced in Nebraska and the old ones sent to the Motor Transport Corps headquarters at Washington for inspection.

No serious maintenance troubles have developed. Since the initial week of the trip, when one truck was damaged when it skidded around a sharp turn on a wet Pennsylvania road and could not continue, there have been no troubles with the four-wheeled vehicles. One motorcycle fork was broken during the struggle over muddy roads August 2.

The convoy has attracted great attention all along the route. When it arrived at Chicago Heights, Ill., which is the nearest point to Chicago on the main route of the Lincoln Highway over which the trucks are running on their journey to San Francisco—the soldiers were greeted by a big delegation from Chicago. The Chicago party included representatives of the automobile clubs and trade association, the Chicago Association of Com-



Each Day, Immediately After the Cross Country Army Caravan Halts, the Soldiers Lay Out Their Cots to Be Ready for the "Go to Bed" Signal, Then Some of Them Rest a While if They Have no Duties to Perform and Others Shave.

west from Lexington, Neb., that it was not possible for them to reach their scheduled stopping place—North Platte—that night. This delay was made up, however, through the convoy going on to North Platte August 2 instead of having the usual Sunday rest period.

More trouble was experienced keep-

Carey of Wyoming and his staff, a cavalry troop from Fort Russell, 150 cowboys and Fred Stone, the actor.

The tractor and the Militor proved of great value in getting over the bad roads. They were often used to help pull the trucks through muddy or sandy bits of highway or over steep grades. The high-crowned roads

merce and various other organizations.

The originally planned itinerary of the trip, from August 16 to its completion, is as follows: Aug. 16, Orr's Ranch, Utah; Aug. 17, Sunday, rest

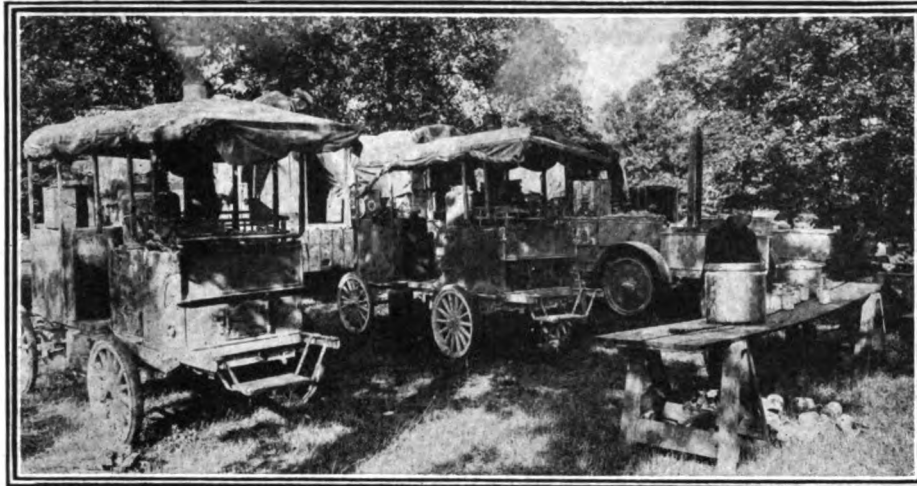
necessity for the improvement of our through connecting routes of travel. It appears to me that the Townsend highway bill now pending in Congress represents very clearly the considered demand of the majority of the people

article by Capt. A. M. Flint of Indianapolis contained the following:

"The most urgent necessity of our country in the immediate future is good roads, permanent roads that can be used 12 months in each year. The roads of America today are absolutely inadequate, inefficient and antiquated. They are not designed to carry the heavy traffic now. What will become of them in the future?

"It is a vital problem, this question of roads, one that reaches down into the very foundation of our social and economic scheme of life, for roads are the clearing-houses for the various States and the only means of free travel.

"In no small measure the success of the Allies is due to the great arteries of travel which the far-sighted Frenchman had constructed in the time of peace. Subjected to a constant stream of heavy traffic for over four years, such as is largely beyond the imagination of those who have not seen for themselves, these roads stood the test, summer and winter, spring and fall, and made possible those victories which resulted in driving the Hun back across the Rhine.



The Motor Transport Corps Takes Its Own Kitchen Equipment With the Ocean-to-Ocean Party. This Equipment Is Carried in Trailers, Which at Each Stop Are Unhooked From the Trucks and Arranged as Shown, in Preparation for the Next Meal.

period; Aug. 18, Sheridan's Ranch, Ibapah, Nev.; Aug. 19, Ely, Nev.; Aug. 20, Eureka, Nev.; Aug. 21, Austin, Nev.; Aug. 22, Westgate, Nev.; Aug. 23, Fallon, Nev.; Aug. 24, Sunday, rest period; Aug. 25, Carson City, Nev.; Aug. 26, Myers, Cal.; Aug. 27, Placerville, Cal.; Aug. 28, Sacramento, Cal.; Aug. 29, Stockton, Cal.; Aug. 30, Oakland, Cal.; Aug. 31, Sunday, rest period; Sept. 1, San Francisco, Cal., terminus.

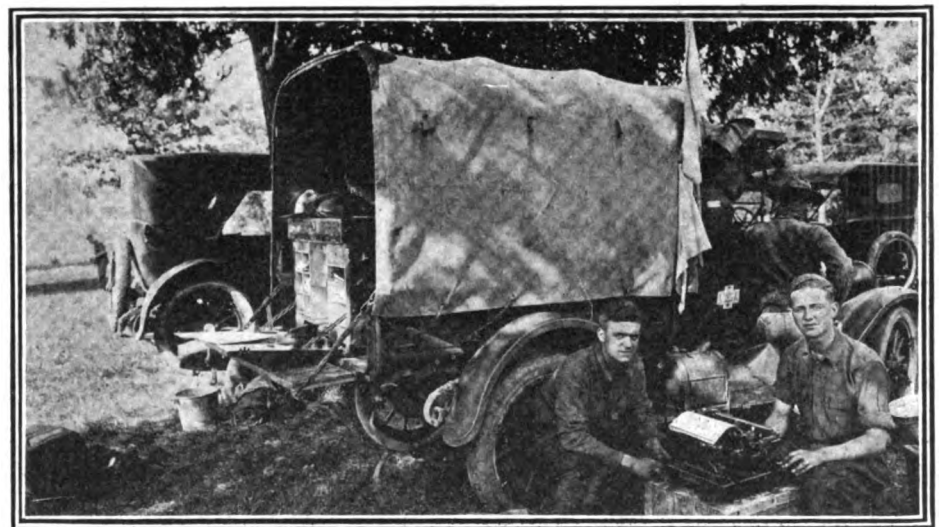
In commenting upon the tremendous enthusiasm aroused all along the route and the nation-wide attention which is being drawn to the Lincoln highway by the First Army Transcontinental Motor Convoy, President F. A. Siberling of the Lincoln Highway Association said:

"Without doubt this first transcontinental run of an army motor convoy will have an even greater effect upon the American highway situation than was originally thought possible. The tremendous significance of the trip seems to be generally appreciated, as does the War Department's aim in authorizing the convoy trip.

"As a great educational demonstration of the possibilities of commercial highway transportation, the trip will do tremendous good, as it will also in focusing public attention in every part of the Union upon the immediate

of the Union for an adequate centralized Federal authority in charge of American highways and a program of Federal construction of main routes to begin immediately."

Proof that our soldiers who are still in Europe are devoting attention to



The Executive Officers of the Transcontinental Army Convoy Have a Legless Office Desk Mounted on the Tailboard of a Dodge Delivery Car—The Military Typist Began to Hammer Out Reports as Soon as the Vehicles Stopped at Chicago Heights.

the need for improved roads is given in a communication to Chairman George C. Diehl of the American Automobile Association good roads board from the editor of the *Amaroc News*, printed at Coblenz, Germany. This papers is giving much attention to the subject of good roads and a recent

"Whether those who are opposed to the building of highways are purposely blind to these facts is not known. In the true sense they are obstructionists. They are a drawback to any community. They are uncivilized. America, because of our government, permits these creatures

to hibernate and live among us.

"Since the time is approaching when all members of the expeditionary forces will return across the seas, it is inevitable that their thoughts should be more and more of home, their minds relieved of the worry of war. America has made a wonderful record during the war; her fame has

spread far and wide by the manner in which her men responded to the call of arms. Are we to show less foresight or less determination in meeting the problems of peace?

"We are faced again with a great problem, for our national prosperity, education and social intercourse of the immediate future demand that this

disadvantage of roads be overcome. This can only be done by honest legislators making laws the enforcement of which shall be placed in the hands of men who have passed the test by service in the construction and maintenance of highways. Good roads, roads that are built for service, mean extended prosperity to America."

Workers Travel by Motor Vehicles

When Strike of Surface Line and Elevated Railroad Employees Ties Up Usual Transportation, Automobiles and Motor Trucks Are Pressed Into Service to Carry Great Throngs of Chicagoans to Their Business Places

By Arthur W. Park

The economic importance of motor vehicles was never better demonstrated than during the strike of street car employees which for four days tied up all electric transportation in Chicago last month.

The fact that serious inter-racial disturbances were occurring in the city's South Side simultaneously with the car strike made even greater demands upon the city's motor transportation facilities. The result left no one in doubt as to the important part which motor trucks and passenger automobiles play in our modern life.

When the car men went out without warning they unloaded upon the city a stupendous task. Fifteen thousand men are required to operate the city's elevated trains and surface cars. These transportation facilities carry, according to the estimates of the company's statisticians, more than a million passengers a day. Unless this vast throng could be transported to its daily work, the business of the city would be at a standstill and a stupendous financial loss follow.

The task was accomplished by means of motor vehicles. The strike was called without warning at four o'clock in the morning. By six o'clock the principal thoroughfares were crowded with trucks, traveling regular routes and picking up employees of the various large manufacturing concerns. This private transportation, however, was very quickly followed by a veritable swarm of vehicles of an unusual "jitney bus" variety.

Small delivery trucks were hastily fitted out with benches and signs announcing the routes which they were to travel. Owners of large automobiles forgot dignity and made the price of a month's supply of gasoline during the first hour. The omnipresent flivver shuttled madly back and forth in great numbers, bearing a full load in the seats and on the running boards.

So great was the congestion in the downtown district that vehicles were barred from the "Loop" after an early hour, but reorganization of the traffic police force soon brought about order.

Out in the south side there was rioting and bloodshed, following a clash between negro and white residents. Every available policeman was rushed to the riot zone leaving downtown corners unprotected during the rush hours. But the problem of handling the swarm of cars was solved by obtaining discharged soldiers to handle the crowds. Many had served as military police overseas, and with their help, and the assistance of the citizens who in every instance exhibited a fine spirit of co-operation and forbearance, the difficulties were ironed out.

The home-going crowds were handled in the same manner and were taken care of with but little delay.

The second day of the strike, the handling of crowds was a revelation to the authorities. System supplanted chaos. The available supply of trucks

was trebled. Public spirited manufacturers donated their delivery trucks for two hours in the morning and two hours at night. The result may be imagined from the following resume of statements gleaned from 20 large establishments located downtown:

The first morning, employees were from 20 minutes to two hours late arriving at work. The second day, few were as late as half an hour and the third and fourth days of the strike, none were later than is usual even when the regular transportation facilities were available. The second day of the strike, when a system of handling the crowds had been evolved of necessity by all those who were engaged in emergency transportation, the loop district was cleared at 6:30 p. m. ten minutes later than the usual clearing time when the cars are running.

One of the effects of the strike in Chicago is expected to be the establishment of many omnibus lines for the transportation of passengers in outlying districts. Following a similar strike five years ago one bus line was started to north side points and has been doing a profitable business ever since. Numberless applications for franchise have been filed but all refused by the city council, partly for political reasons and also because the city participates in the earnings of the surface and elevated railway companies.

For months, however, agitation in

favor of improved transportation has been "fashionable" and the great success achieved by motor vehicles in handling crowds has been brought forcibly to the notice of the riding public. It is believed that public demand for the enfranchisement of 'bus lines will be sufficiently strong to impress upon the aldermen the advisability of immediate action.

Motor trucks also played a large part in the suppression of the race riots. The region of the riot was practically isolated after the first day by a strong cordon of police who prohibited residents from leaving the district or strangers from entering. Finally food supplies in the riot zone were so depleted that it was necessary to haul in large supplies and sell it from the trucks on the street corners.

It was not until the third days of the riot that Mayor William Hale Thompson called upon the state troops to protect residents of both races. Prior to the call, the Adjutant General had ordered all Chicago companies mobilized at their barracks and held in readiness for any action that might be required of them.

When the order finally came which sent the troops into action, it came at nine o'clock at night. About five the same evening Adjutant General Dickson had been convinced that the call must come before morning. He sent his aids out to commandeer trucks wherever they could be found.

The truck squadron was concentrated at Grant Park, in the downtown district, and when the call came they buzzed away to the various armories

and hauled the soldiers, who carried full war equipment, to their posts of duty. When the soldiers had been taken care of the trucks returned to the armories to haul the kitchens and other company equipment to the scene.

Motor trucks were maintained at all company headquarters and several times prevented serious consequences by taking flying squadrons of troops to points where an outbreak seemed imminent.

Altogether it is conceded that the motor vehicles saved Chicago serious consequences both from the strike and from the race-riots and that it certainly convinced even the most skeptical persons of the increasing value of automotive transportation.

Need of Motor Club in Small Town

Active But Small Automobile Organization in Place of 1,500 Inhabitants Proves Able to Obtain Improvement of Town Highway — Influential Citizens Had Previously Made Many Earnest Efforts without Any Success

By C. M. Adams

Because the automobile club is most heard of in the city it has come to typify an organization numbering thousands of members, housed in spacious, luxuriously furnished quarters, and exerting an influence far beyond the bounds of its home city.

So universally has this concept been accepted even by motorists that the possibilities of an automobile club in a smaller community have not only been largely untried but quite overlooked. For that reason the experience of a particular Ohio club may prove to be a record of interest to the hundreds of thousands of car owners who do not belong to a powerful city club because they do not live in a city.

This club has no spacious quarters. Its property consists of a set of books, a few files and an incorporation charter. It has only 125 members and is located in a town which numbers but 1,500 inhabitants. Yet even in the few months it has been in existence it has taken a long step toward the realization of the purpose for which

it was organized, a purpose dear to the heart of every car owner, driver or passenger—the improvement of roads.

Ohio has many fine roads. But down in the southwestern corner of the state in Clermont county are some stretches which daily users have profanely vowed to tear up complete and present to some bad roads museum as a warning to future generations. And nearly surrounded by this sort of highway is the village of Milford.

Since the days when gasoline mileage displaced the weather as a theme of conversation Milford car owners had registered disapproval of the roads in their vicinity. Not only did they object to the highways they were compelled to traverse while going in and out of the town but also streets they were obliged to use while in town. But it availed them little. Individually, in succession, in rotation, in pairs and in squads, they angrily objected, only to be met with the answer usually forthcoming from both county and town officials — "no money."

Months became years while mud-holes became abysses and puddles grew into swamps, and still they continued to kick as individuals or couples. Then early in June the Milford Automobile Club was formed.

"We'll never get a thing till we all pull together," the few who attended the first meeting agreed, and straightway began to pull. The object of the organization was announced to be the improvement of roads and other items pertaining to the welfare of car owners and drivers. Dues were placed at \$5 per year and memberships solicited. Within a month 100 were enrolled and in good standing.

Then the work began. On a site some three miles from Milford the government had established an air nitrate plant for the production of raw material for explosives.

To connect the town with this site it was necessary to resurface a section of intervening road, and the club set about the task of having this done as a sort of teething job. County commissioners, township trustees and

village officials were seen, interviewed and presented with arguments not by a group of individual car owners but by a committee representing the Milford Automobile Club. The work was done in a short time.

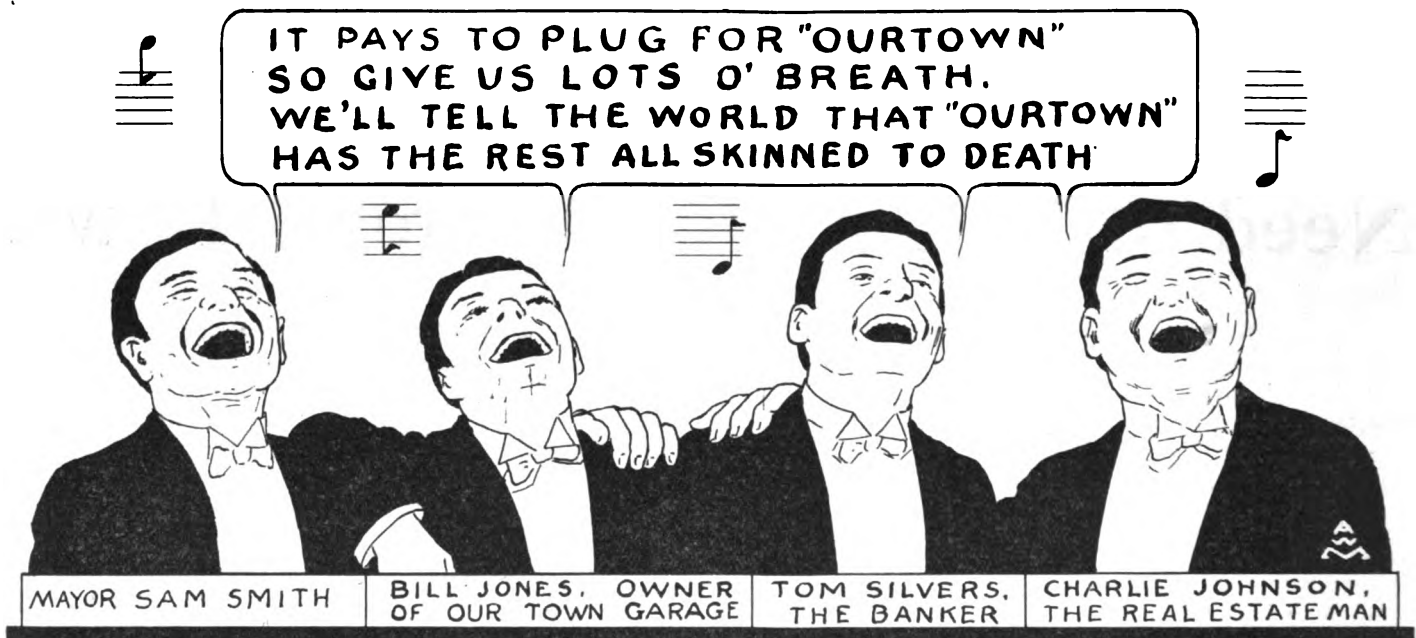
The main street of Milford is a section of a trunk road used constantly by all sorts of motor traffic, but by the historic method known as "passing the buck" its repair had been left entirely to the village, which, like most Ohio towns and other towns as well during recent years, had become perilously near the verge of bankruptcy through insufficient revenues.

in a nearby city was taken over the street and shown actual conditions. Statistics showing the use of the street by motor traffic in war service and mail work were compiled. Every legitimate step was taken and influence used that expediency showed was necessary. And the results were forthcoming.

For what is said to be the first time in the history of the Ohio highway service the State agreed to construct a street in an incorporated town and with the help of additional funds raised by popular subscription, appropriated by the village, and last but

No coercive methods have been used. Nothing suggesting undue influence, appeals for sectional favoritism, or even a resort to political propaganda have been used. Everything has been legally and ethically above board. Yet the organization has succeeded where individuals have failed simply for the reason that it was an organization.

"The Milford Automobile Club" inscribed on business stationery has carried more weight and commanded more respect than the combined cards of a half dozen leading citizens of undoubted personal influence. It is



With the Sincere Desire to be of Service to His Town and the People, Every Automotive Dealer Should Join the Local Commercial Organizations—To Be a Real Part and Parcel of His Town He Should Be "Somebody" in His Clubs, If It Takes 27 Hours a Day.

By reason of greatly increased travel due to war transportation this street had become worn to a muddy, deeply-rutted trail with no possibility of repair by the village. The county commissioners disclaimed responsibility and pleaded also lack of funds. The only hope left was the State Highway Department.

Appeals to this quarter had been made frequently in the past by numerous individuals but without results. The State department officials did not make a practice of repairing village streets, even though they formed a section of main road. But the club went steadily ahead.

Village officials were asked to appear before the highway board and state the case from the village standpoint. A member of the board living

not least, given from the treasury of the club itself, the work has been successfully carried through.

Compared with the scores of miles of velvety boulevard the mile and a quarter of macadam which was built through the efforts of this little small town club probably seems insignificant. Compared with the great conspicuous organizations of the city the club itself probably seems insignificant. But in its way and in its field this little club has done as much as any of its larger and older brothers.

"United we stand, divided we fall" is so familiar that it has become a mere truism, but its vital truth is still operative. Co-operation has been the single cornerstone on which the success of this little Ohio club has been founded, and it has proved most sure.

the old, old but always new story of organization, applied this time to a field hitherto left to the individual.

What has been done at Milford can be done in a similar local way by any of the thousands of other small towns in the country where unorganized car owners are striving vainly to accomplish improvements in roads or the other items which affect them and as long as the individual car owners of the small towns act as mere individuals, no matter what their influence may be, just that much longer will they postpone the achievement of their efforts. It remains only for these towns to shake off the delusion that an automobile club is a city affair, organize and set to work. Results will come just as the organization is stronger than the individual.

Tentative Chart of Accounts Set Up

Because the Average Automotive Dealer or Any Other Business Man Wants to Know His "Present Worth" and "Result of Operations" an Elastic Chart Purposely Incomplete, Is Given for Which Suggested Additions Are Requested

By J. Newton Boddy

Manager System Department, Tanner, Gilman & Ellis, Chicago.

In setting up this chart of accounts, we are keeping in mind Mr. Average Automobile Dealer. This chart is of necessity tentative only and must be elastic to meet the requirements of the average dealer.

What the average business man wants to know is his "Present Worth" and "Result of Operations." With this fact in view his accounts are chartered to present a balance sheet or statement of assets and liabilities and operating statement or statement of profit and loss.

We do not purpose to have anyone "wade out beyond their depth" in the whys and wherefores of bookkeeping, so we present without further introductory comment the following tentative chart of accounts:

Assets—

- Cash.
- Petty Cash.
- Liberty Bonds.
- Notes Receivable.
- Accounts Receivable.
- Deposits Receivable.
- Merchandise.
- Unfinished Work.
- Shop Equipment.
- Office Equipment.
- Buildings and Real Estate.
- Investments.
- Unused Insurance.
- Unused Rent.
- Unused Supplies.

Liabilities—

- Notes Payable.
- Accounts Payable.
- Notes Receivable Discounted.
- Deposits Payable.
- Pay Roll.
- Accrued Payables.
- Allowance for Doubtful Accounts.
- Allowance for Depreciation Merchandise.
- Allowance for Depreciation Shop Equipment.
- Allowance for Depreciation Office Equipment.

| | | |
|---------------------------------------|---|-----------------------------------|
| Allowance for Depreciation Buildings. | } | For a Corporation. |
| Capital Stock Surplus | | |
| Profit & Loss | | |
| Investment Undivided Profits | } | For an Individual or Partnership. |
| Profit & Loss | | |

Revenues—

- Sales.
- Cost of Sales.

Expenses—

- Service Expense.
- Sales Expense.
- General Expense.

Other Income—

- Interest Earned.
- Discount Earned.
- Sundry Income.

Other Deductions—

- Interest Allowed.
- Discount Allowed.
- Sundry Deductions.

This article is intended only to present a chart of accounts.

Cash.—You will probably notice that we have no place for "Bank" on our chart accounts. As the bank is a place of safekeeping and convenience for our cash it means the same as cash and so we carry but one cash account with a memo account with the bank to show how much of our cash it must account for. To cash, petty cash and liberty bonds might also be added postage stamps and war savings stamps.

Merchandise.—This account is the general account to cover the line of merchandise you handle. As dealers follow no fixed policy in handling merchandise we outline herewith most of the accounts which will come under the general heading merchandise: New cars, used cars, gasoline, oil and grease, tires and tubes, parts, supplies and accessories, trucks, trailers, tractors, tops and bodies, labor.

Pay Roll.—This account shows the way your salaries and wages are

distributed and the balance will indicate the amount you are liable for to employees.

Accrued Payables.—This account represents liabilities for which you have not yet been billed.

Capital Accounts.—You will notice we have shown two groupings of these accounts, one for a corporation and one for an individual or partnership. Investment and undivided profits are generally shown as net worth.

Sales.—In general the comments on merchandise apply to sales account. You will carry, however, more sales accounts than merchandise, adding such accounts as repairs, vulcanizing, battery department, storage, washing and polishing, painting, upholstering, etc. The average dealer will confine his activities to but a few of these departments, but it is very necessary that he show in detail his trading accounts.

Cost of Sales.—For every sales account we will carry a cost of sales. The comments under merchandise and sales apply also to the cost of sales account.

Service Expense.—This is a general account for shop expense accounts, labor, supplies, and shop portion of general expense.

Sales Expense.—This is a general account for salesmen's salaries and commissions, demonstrating expense, repairs and free service on cars, insurance on cars and sales portion of the general expense.

General Expense.—This is a general account for all general expenses incident to the business, including rent, heat, light, power, telephone and telegraph, office and officers' salaries, advertising, entertainment, association fees and dues, depreciation of merchandise, depreciation of shop equipment, depreciation of office equipment, depreciation of buildings, bad debts, law and audit, insurance.

(Concluded on page 54)

Showcase Display Brings Profits

The Proper Arrangement of Accessories in a Neat and Attractive Manner Produces Sales Which Otherwise Are Never Developed—Unique Tire and Accessory Case for Very Close Quarters Brought Many Customers to Dealer

In many garages and other retail automotive establishments where the space for the display of merchandise is limited, accessories as a rule, are crowded and in anything but a neat and attractive arrangement. In some places they are carelessly scattered around on shelves or drawers in order to make room for the stocking of tires.

Tires require considerable space and while a representative supply should be kept on hand at all times, still there is no need of displaying all of them for the purpose of creating sales. Tires will sell themselves if you have an assortment to suit your trade and keep only a few of the styles on display. When a car owner needs a tire he will come and buy one, you can't make him buy a tire when he is not in need of any.

Accessories, on the other hand, are things which the average car owner very seldom thinks of. Unless they are displayed and advertised so as to attract his attention he will very seldom buy them. Again if they are so displayed that they easily accumulate dust and dirt in time they will lose their newness and salable appearance,

making them hard to dispose of unless offered at a reduced price.

Neatness and arrangement for attracting attention should characterize the display of accessories if you want these goods to be sold. And they will sell for there are plenty of reasons for the sale and the returns are good. You have to educate your customers to the uses, advantages and practical features of your accessories and the foundation for such a trade building is the proper arrangement of them in the salesroom, tire store, repair shop or supply station.

There are various ways of displaying these accessories, but where the amount of space is limited the arrangement cannot be carried out to advantage. A combination tire rack and accessory case which has solved the problem of one dealer and considerably increased his sale of accessories is shown in Fig. 1.

The front upper part is for the display of accessories, the shelves can be made of either glass or wood, about eight inches deep and preferably should be adjustable. The glass in the sliding doors can be just ordinary single pane or plate glass. Here

can be kept boxes of tubes, spotlights, pocket flashlights, tire repair kits, cements, polishes, etc. They can be neatly arranged and will not collect dust or dirt.

The two short drawers can be used for stocking bulbs, sparkplugs, tire pressure-

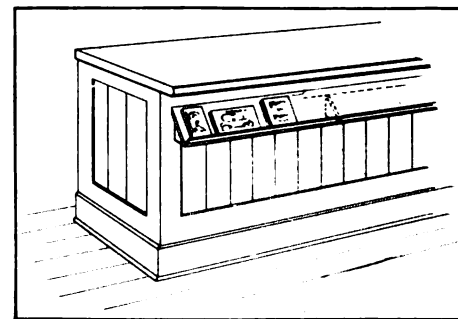


Fig. 2. Method of Utilizing Counter Front to Have Place for Advertising Booklets.

gages and valves. The top of the case can be used for placing some of the counter displays, and literature sent out by the manufacturers.

The rear top portion is designed for the storage of smaller sized tires and the lower part for the larger sizes.

The lower part of the front of the case should be panelled as shown, the sides can be plain. The upper part of each side can be used for posting advertising matter, instructions for the use of certain accessories, or for notices. On each side of the lower half a brass, copper-bronze, or just an ordinary black hook can be fastened and a sample tire hung on it to show make or style.

The size of this case will depend entirely on the amount of room available. A nice size would be about eight feet wide, six feet high, and about 40 inches deep. It can be made of any kind of wood desired: pine, walnut, cherry, oak or any other suitable for the purpose. The finish can be made to suit the owner's taste but should be in harmony with the surroundings. A dark English oak finish makes a neat job.

Another case which is very suitable and attractive is shown in Fig. 2. It is an ordinary counter with a shelf, about eight inches wide and tilted at about 60 degrees, attached to the front of it a little below the top. This shelf is used as a receptacle for the display of current literature dealing with accessories, tires, etc.

If you contemplate getting a new display counter have this shelf built on at the factory, or if you want it attached to your old one it can very easily be done by a carpenter or even by the average mechanic.

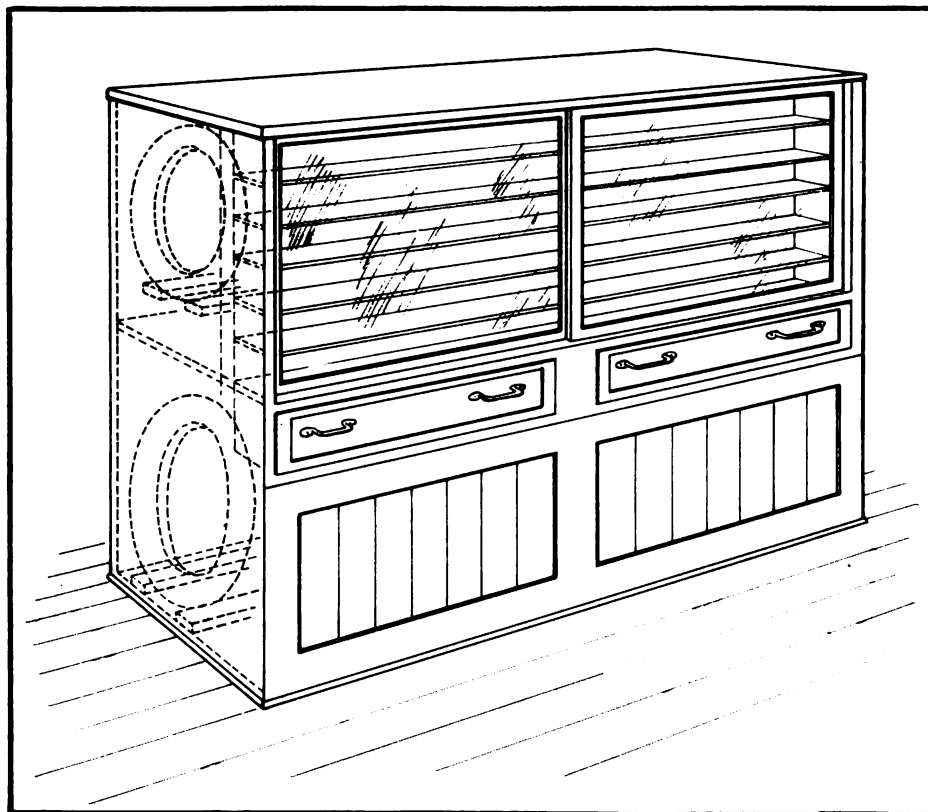


Fig. 1. Combined Tire Storage Rack for Two Different Sizes of Casings With Shelves and Drawers for Attractively Displaying and Keeping Various Automotive Accessories.

Motor Truck Transport Grows Fast

Automobile Industry Develops into the Third Largest in the World in a Period of Twenty Years—Motor Truck Branch Attains a Commanding Place in a Much Shorter Time, Due to Faith of Dealers and Distributors

By N. H. Cartinhour

Commissioner, Commercial Vehicle Division, National Automobile Dealers' Association.

In no branch of industry has there been a greater metamorphosis than in the use of commercial motor vehicles during the last five years as a means of transportation. It is safe to make the assertion that in all the history of mankind there has been no change in the media of traffic, even slightly comparable to the rapid development of the motor truck in the short period of its use.

The tendency in traffic development has always been toward faster movement as the transition from the ox cart to the horse-drawn vehicle, then to the railroads, electric lines and now airships, so clearly shows. But the use of the gasoline driven motor has had a breadth of development over long and short distances that reads like a fairy story.

The pioneers in this business, as it affects the greatest number, are the dealers and distributors. They foresaw the future of this industry and threw their means and energy into the building up of strong organizations to take care of the demands that their communities would make on them.

An abiding faith in business and the belief that our United States is the best place on earth to grow, has given us such great industrial organizations as the United States Steel Corporation, Marshall Field and Company, The Ford Motor Company and countless others.

In the short period of 20 years the motor vehicle industry has grown to be the third largest not only in the United States but also in the world. That its future is assured is best attested by this rapid growth. Its substantial character is evidenced by the financial strength of the great motor industries which are giving employment to untold thousands and on whose resources a hundred million Americans are making their demands for those elements of life that afford security, profit, comfort and personal content.

It took 10 years for the passenger automobile to prove its real utility and less than five years for the motor truck to take its place as being an indispensable means of business transportation. In the cities today the horse-drawn vehicles are few in number, whereas five years ago the streets were filled with them.

How about the bone and sinew of it—the motor truck dealer and distributor? What could the manufacturer do without these channels of distribution? What would the thousands of truck owners do without

the service of those men who "keep the wheels going." It is a long jump from the owner to the manufacturer. The dealer and distributor form that connecting link without which this industry could never have reached its present state of development. In spite of this fact the dealer today is only a buffer, a football tossed back and forth between the manufacturer and the owner. On his shoulders are placed the burdens of service which rightfully belong



Big Expansion in Truck Trade Is Predicted
by N. H. Cartinhour.

elsewhere and the expense of which is a constant drain on his resources. Why is this? Because he has never organized except as being an automobile dealer he may belong to a local organization and a comparatively few only to the National Automobile Dealers' Association.

The motor truck dealer will realize in time, if he has not already done so, that there is a wide difference between sales and service on motor trucks and automobiles.

The benefits of organizations are manifold—exchanging experiences with the other fellows, the development of ideas that come from open discussions of questions and problems pertaining to the business, learning from records what the manufacturers are doing and how they co-operate with their dealers and distributors. In a word, becoming bigger men, broader minded, better informed. In this respect mapping out lines of common practices and

policies, all of which means giving better service to the owners at a cost to the dealer that means a profit to him instead of a loss.

But there are still larger benefits to be derived from organizations. The officers and committees of the organization are your watch dogs on unfair legislation. They keep their eyes on the barometer of the trade and are quick to detect any violent fluctuation which may effect you. They keep you, as members of the organization, informed of whatever it is to your interest to know.

During the great war the automobile was classed by the priorities committee of the War Department along with hair pins, perfumery, chewing gum, etc., as being a non-essential in the conduct of the war.

The officers of the National Automobile Dealers' Association went to Washington and appeared in person before the priorities committee to protest against this unjust discrimination of the third largest industry in the United States. It is, indeed a surprising statement that their action was based on the mere supposition that people did not have to ride an automobile. They lost sight entirely of the enormous capital invested in the industry and of the hundreds of thousands of people making their living out of their jobs in these plants. Nor had they considered the 27,000 dealers and distributors throughout the United States whose money was invested in buildings containing salesrooms, service stations and parts departments.

The priorities committee immediately removed the automobile from the non-essential class and put it where it belonged. Here is one of the benefits to the dealer and distributor of a central organization whose officers are always alert and trained to detect a cloud on the business horizon.

In the next few years there will be much radical legislation attempted by the several states and unless there is a body of men, such as make up the official roster and committees of the National Automobile Dealers' Association, who watch this and forestall it, the owner and dealer will be greatly handicapped.

These two illustrations are typical of many others and if the motor truck dealers and distributors throughout the United States could be brought to realize the advantage of organization, they would rise as one man and lend their co-operation. They will be brought to a forcible realization of

what their failure means, if they neglect the opportunity offered by the National Automobile Dealers' Association. The future of the motor truck dealer and distributor will depend upon his becoming a more astute and careful business man, giving service and earning its honest value, or he will measure his losses by the old standard of loose, haphazard methods.

The abuses of today in the way of cutting prices, allowing the freight cost, must be done away with. As long as the conditions remain as they are, these causes will continue, but a better understanding among dealers and a correct appreciation of their importance to the community will shame many a man who in the past has lowered his standing by unbusinesslike methods.

It is not an uncommon remark to hear a business man say "I would not pay list price for any automobile or truck because they are all price cutters." What a sad commentary to have made about the dealers and distributors of the third largest industry in the United States. And yet who is to blame?

Could you go into any first class dry goods store, men's furnishings store, grocery, etc., and get them to cut prices? No, their prices are marked in plain figures and you pay for them or leave them. Truck prices are common property. Every business man can learn the actual list price of various makes and models. Why does not the dealer get the list price? It is his fault only.

Organization is the cure for those abuses. The manufacturers get their prices and the owners get the full benefit of the operation of their trucks. The dealer almost always is the "goat."

Special stress has been laid on price cutting. This is for the purpose of illustrating one of the abuses so common to the dealer.

What about the dealer and his future? It is a big question. The commercial vehicle division of the National Automobile Dealers' Association has been created to co-operate with him and serve as a clearing house of information on all subjects that are of paramount interest to his success.

Easily-Made Truck for "Towing-in" Disabled Cars.

Every garage or repair shop has occasional calls to tow in disabled cars with either or both of the front or rear wheels lost or broken, and should have on hand a truck for this purpose. A truck of this kind can be built with two heavy metal wheels about ten inches in diameter and a two-inch rim. On this should be mounted a ten-foot tongue and directly above the axle should be secured a hook-shaped piece of iron or steel for engagement with the automobile axle.

Better than a towing rope for towing in cars is a towing pole, which will keep the car at a safe distance and will do away with any possibility of one car running into the other, and resulting in serious damage.

Truck Executive Favors Building Heavy Duty Highways.

There is a report that a strong sentiment exists in many sections of the country in favor of gravel roads," says Carl H. Page, vice-president of the Fulton Motor Truck Company, in a talk he had with a Fulton distributor who said the truck manufacturers of America and the dealers and distributors are the men most interested in the subject.

"We who are manufacturers of motor trucks, and the Fulton company is now engaged on a program calling for more than 3,000 vehicles this year, are surely interested," Mr. Page agreed. "But I feel that far too little attention is being given to this matter by the makers. To build gravel roads would be an expensive blunder. Good roads mean cement highways such as those of Wayne county, Michigan, or other heavy duty roads equally durable, as it looks to me.

"In Wayne county they are to carry out a season's road-building program with money saved that was originally set aside for repairs to the highways, which need little or no repairs. That is the sort of a road wanted all over the United States, for it means the more general use of motor trucks.

"If roads are to benefit the farmer, the manufacturer and the merchant equally, they must be of the permanent type. The utility of building macadam roads and gravel roads has been shown under the stress of war times, for such roads have gone all to pieces under the hard work placed upon them through exigencies of the times. Thousands of Fulton trucks have naturally been delivered by roads, and we have gathered much data from our distributors and dealers on road wear and road conditions everywhere.

"Roads which are right must be such that they can be used alike in drought or deluge, in the heat of the summer, in the intense cold of the winter, and give the minimum of vibration and permit of sufficient speed to enable the truck owner to compete with all other methods of transportation. The upkeep of such a road is negligible, and the saving in time is one great asset, while the saving in the condition of the truck is still greater in returns.

"The matter in which the Dixie Highway out of Detroit to Toledo stood the test is proof that what America wants is like roads everywhere. That stretch of road saw thousands upon thousands of motor trucks traveling to the seaboard, saw hundreds of thousands of tons of merchandise carried over the fine surface, and yet there was not the slightest trouble at any time during the severe winter of 1917 and 1918, nor the last winter, in traveling this road with heavy loads at top speed of the truck. And the Detroit-Toledo road showed not the slightest sign of wear and needed no repairs even under this stress of war traffic and the regular

business traffic. It is that sort of road which, built throughout America, would insure beyond any doubt the future of the motor truck, and the Fulton Motor Truck Company will do its share to insure that sort of highway.

Army Road Equipment to Be Used in Federal Highway Work.

At the request of the Department of Agriculture, the War Department has ordered to be returned from France as soon as possible a large quantity of engineering equipment to be distributed by the Department of Agriculture, through the Bureau of Public Roads, to the states for use in the construction and maintenance of Federal aid highways.

The equipment will be distributed to the states without charge, in accordance with recent legislation empowering the Secretary of War to turn over to the Secretary of Agriculture surplus military equipment not needed for military purposes but valuable in highway construction work. The equipment will be apportioned on the basis of the allotments in the Federal Aid Road Act, in the same way that 20,000 army motor trucks are now being distributed by the Bureau of Public Roads at the request of the state highway departments.

The equipment which the Secretary of War has been requested to return from France includes about 1,500 caterpillar tractors, about 400 road rollers, steam and gasoline engine driven, and a large number of concrete mixers, road graders, elevating graders, rock crushers, industrial locomotives, industrial railway track, dump cars, steam shovels, hoisting engines, electric motors, and quantities of smaller equipment.

In his letter requesting the return of this equipment the Secretary of Agriculture said:

"The highway-construction program which the Federal government and the states propose to begin immediately is the largest public undertaking contemplated in the near future. It offers an immediate field for the employment of labor and the use of materials that will help to stabilize business along a number of lines. The work has been expanded so suddenly that it has not been possible to make adequate provision for furnishing the necessary equipment, and previously all the available supply was absorbed by the demands of the War Department.

"I am sending you this list as a result of a conference which I have just held with the executive committee of the American Association of State Highway Officials, at which it was represented that the various states are very anxious to secure additional equipment of the kinds indicated.

"I am in sympathy with the efforts that are being made by the War Department to aid returning soldiers in securing employment. I am convinced that if the equipment and supplies listed are made available, it will facilitate highway construction and thus stimulate employment."



Recent Events and Trends in the Automotive Selling Field as Depicted by the Cartoonist.

Women Do Welding on N-C Fliers

Naval Seaplane That Accomplished First Ocean Flight from America to England Took Samples of Delicate Welding Done by Feminine Workers in Curtiss Plant Where All of the Navy Flying Boats Were Constructed

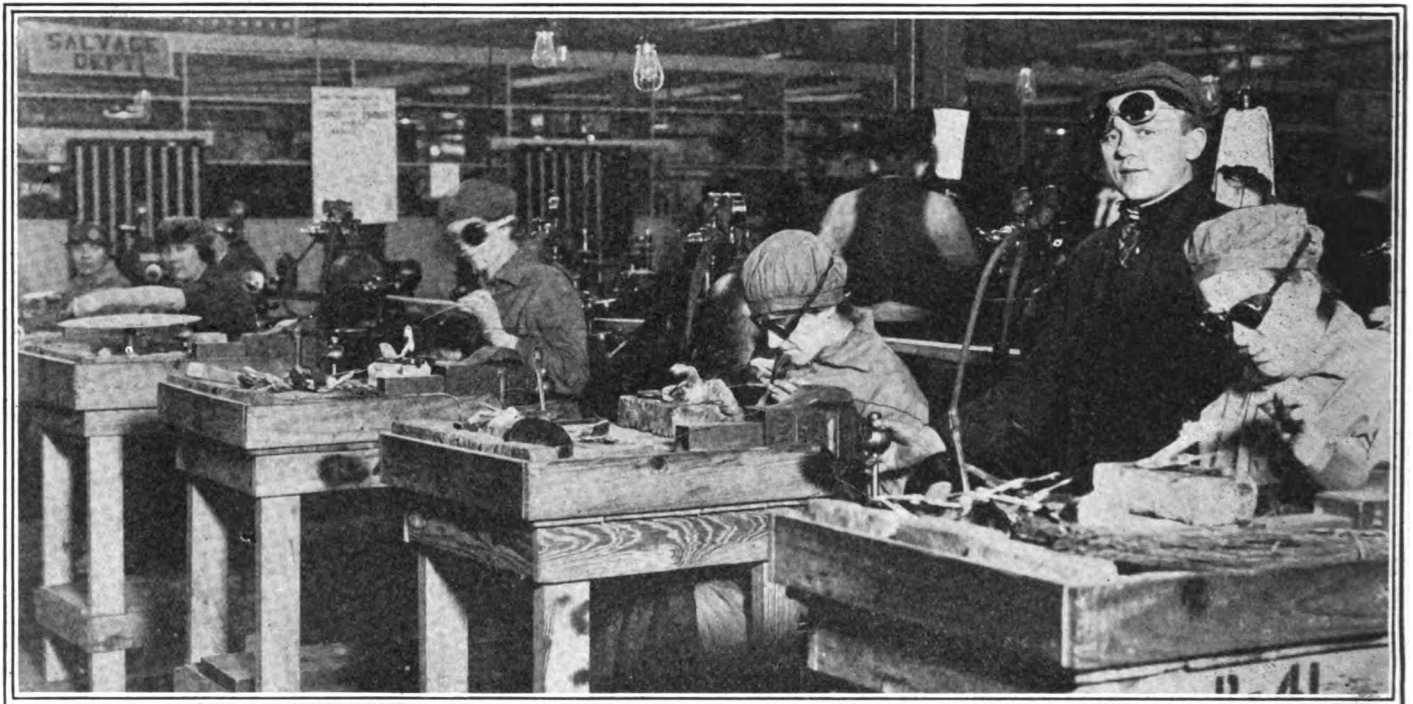
There is not a single male welder at work in the Curtiss Engineering Company's factory at Garden City, Long Island. All the welding on Curtiss products, including the N-C boats, four which have been produced in the last two years, has been done by women, the three N-C's that started on their way across the Atlantic the

capacities as opportunity occurs. At present splicing, soldering, wire-wrapping, light painting, filing, wing covering, coppering, and welding are being carried on by women.

"Every woman welder ever employed by the Curtiss Engineering Corporation," said Joe Benham, foreman of the welding department, "is

of their mechanical training, and listen attentively to directions. They learn very quickly and diligently, and having no previous shop training, learn how to do the work correctly.

From the standpoint of the organization women are highly satisfactory. "The work which these girls do," stated Mr. Sullivan, "is not usually



Girl Welders at Work on Parts of Naval Seaplanes in the Garden City Plant of the Curtiss Company—The Fair Welders of the Torch Did All of the Welding Work on the N-C 4 and Its Companions of the Air That Started the Flight to Europe.—This Undertaking Was Successful so Far as the N-C 4 Was Concerned and Probably Will Result in the Machine Some Day Taking Its Place as a Symbol of National Achievement by Being Placed in the Smithsonian Institute at Washington When Its Flying Days Are Over.

N-C 4 being successful in the epochal attempt carry among other things a sample of what American women can do in aeronautical construction work.

The Curtiss Companies began to employ women during the early days of the war. When F. H. Russell went to the Garden City plant as general manager he definitely established a policy of employing women in a number of factory departments. Manager N. L. Sullivan of the employment department has accordingly been gradually increasing the force of women workers, utilizing women in new ca-

still on the job. I guess that indicates how they like the work and how we like them. One girl quit for a while, but she is back again. I don't know a man in the factory on whom I could depend to do better work than our girls get out."

The reasons for the success of women as welders are simple and good ones. The work is delicate yet not intricate. The women have the patience to stick by the comparatively monotonous task, and develop remarkable skill in handling it. They do not come with an exaggerated idea

worth more than 35 cents an hour. We pay this to a girl of experience, and in some instances pay as high as 45 cents. We get as good or better results as we could hope for from men, and men would cost us from 40 to 60 cents an hour, at the same time chronically dissatisfied with the limiting nature of the work.

"The women are accurate, patient, and well satisfied. They have taken out hundred and two hundred dollar bonds during each Liberty Loan drive, and declare that shop work has office work beaten in a dozen ways."

The welding which Curtiss women workers do includes flat, fillet, and aluminum welding. The latter is the most difficult. It not only requires a knowledge of how to manage the torch, how to get and maintain the proper heat both for the elements being welded and the thin wire which is fed into them, but it exaggerates all the difficulties of steel welding, and demands an extremely light touch and deft application of the metal joining the separate pieces which are being made one. Yet women workers are doing all of the aluminum welding, and doing all of it so well that there is now no chance of their ever being taken off the job.



Welding and Brazing School Department of the Curtiss Aeroplane & Motor Corporation's Plant at Garden City Where Women Pupils Are Instructed in the Manipulation of a Torch Before Joining the Ranks of the Regular Welders.

"Trade-In" Trucks Dealers' Problem

Tradesmen Handling Commercial Motor Vehicles Must Give Careful Consideration to Question Presented by Prospective Purchasers Who Wish to Turn In Their Old Trucks as Part of the Selling Price of New One

By R. F. Moore

Advertising Counsel, Derby Motor Truck Co.

The question of trading in old trucks on new purchases is one that is becoming more important in the retail field, as the business grows and a great many vehicles are no longer efficient.

It is not a problem that can be dismissed with a refusal to consider trade-ins, as in many cases, it is a legitimate transaction and the truck which is no longer desired in one business can be used in another. Each case must be considered separately, and decided on its merits.

There are some cases where a truck, offered for trade-in, is worthless and is used merely to get a low price on a new truck. The wise dealer will refuse to consider any proposition of this sort, as it is the surest way to lose your profits. Junk value is all that should be allowed—anything beyond that is plain price cutting.

There are, however, many cases where trucks of value are offered—some "misfit" installations, representing poor judgment on the part of the buyer and seller, some trucks that the business has outgrown, some that need thorough overhauling to put in shape to give good service. On these the dealer can realize quickly, and can afford to offer fairly near what he can realize on them.

Ordinarily it is poor business to allow all you can get for a trade-in, for you must remember that you have two sales to make—the new truck and the second-hand one. The benefits derived from the sales

should be sufficient to justify the time, effort and expenses involved.

One class of "trade-in" should be avoided—the obsolete type that has been superseded by more efficient designs. In this class are old chain drives, "orphans," and "freak" trucks. These are almost always "white elephants" that refuse to be sold, or at least stay sold.

However, what we are most interested in is how to handle this problem. And there are almost as many ways as there are dealers.

Some organizations that maintain a large service department find it best to handle all this work themselves. They can thoroughly go over the truck at very little cost, handling it when the workmen are not otherwise engaged. Rebuilding can be done by utilizing time that would otherwise be wasted, and a good profit obtained on the second-hand sales.

Other dealers have found it better to handle second-hand trucks through a separate company. One Denbyman has an arrangement with an excellent organization devoted wholly to the rebuilding of trucks and their resale. This company handles a large volume of second-hand jobs, has excellent outlets for them and is able to make a quick turnover at good prices. Its representative appraises the truck for the Denbyman, and the allowance is fixed on this appraisal.

This method of handling has many advantages. It divorces the second-hand

sales from the new sales, eliminates the necessity of storage space and simplifies the whole transaction. It also furnishes an expert's opinion of the value of the "trade-in." The activities of the dealer's whole organization are concentrated on the sale of Denby trucks.

Another valuable help in handling "trade-ins" is the system adopted recently by the Detroit Auto Dealers' Association. They publish weekly a report of the sales price of second-hand cars during the week past. This has a tendency to fix a uniform value on a given truck and model and stabilizes the business. To a large extent it prevents the truck buyers from making exorbitant demands for allowance for "trade-ins."

We would be glad to have an interchange of ideas on this subject. Let us have your views on this subject. Your method of handling this may help the other fellow, and his, you.

To Case Harden Soft Steel.

A very good method of increasing the durability of small tools that may be made from soft steel is to form on the outer layer a thin case of hard steel. To do this, heat the part to a bright red and sprinkle it with potassium-cyanide. This cyanide will fuse and spread over the entire surface, thereby changing the outer layer of the metal to "tool steel," the depth of which depends upon how long the heat is held after the cyanide has been applied.

Welding, Cutting and Brazing Practice

Repairing a Rear Axle Housing Can Be Accomplished by Means of an Oxy-Acetylene Torch in a Satisfactory Manner but the Work Cannot Be Classed Strictly as a Welding Job, the Task Being More Like Brazing

By David Baxter

The rear axle housing is one part of an automobile that may be repaired with an oxy-acetylene welding torch, and yet in the strict sense of the word it is not welded. Many of the details of a welding job are the same but it is really not a welded job; the work being more of the nature of brazing. Although these castings may be actually welded the work is not successful. Most of these housings are made of malleable iron, which turns to a worthless brittle form of cast iron upon being melted. This changed metal is white and glassy, filled with small holes.

is properly executed. To do this the repairman should employ a good grade of bronze for a filler rod, such as Tobin bronze, together with the proper cleaning flux.

It will be better to use a larger tip on the torch than he would use for the same thickness of cast iron. The welding flame should be regulated with special care since it is desirable to heat a comparatively wide zone without danger of burning the malleable iron or bronze. Some welders find it more satisfactory to employ a slightly carbonizing flame when brazing malleable

of malleable iron since experience has taught the use of steel wherever the strain is greatest. However, there are some malleable iron castings on most cars, one of the commonest of which is the rear axle housing. This casting will probably come into every automotive repair shop sooner or later, so it might be well to take it to illustrate the process of brazing malleable iron.

In Fig. 1 is shown a common type of rear axle housing. The fracture is clearly indicated, as is also the chamfering on the broken parts. The thickness and weight



Fig. 1—Rear Axle Housing, Broken Into Two Pieces, Awaiting the Torch Welder.

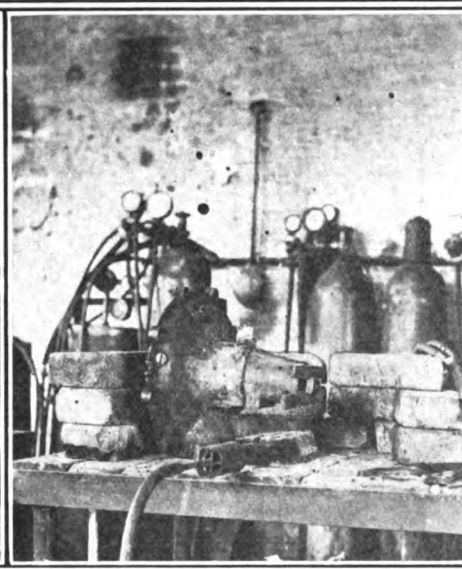


Fig. 2—Broken Rear Axle Housing Clamped Together in Position for Brazing.

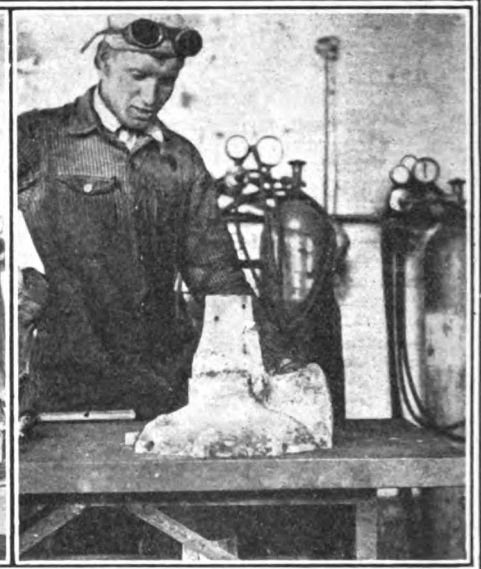


Fig. 3—How the Housing Appeared After the Bronze Filler Had Been Used.

It is this brittleness that defeats the welding process since it renders the weld liable to be easily broken under the least strain. This is true no matter if the depth of the melting in the weld be but a bare fraction of an inch. Any part of malleable iron that is brought to the melted stage is changed to hard brittle iron, lacking in ductility, especially at the edges of the weld where the filler joins the casting, if cast iron is used as the filler, although cast iron unites well with it.

Mild steel and Norway iron fillers do not unite well with malleable iron. Where the junction is made it still possesses the failing of hard brittleness where the malleable iron is melted.

Now, in spite of this array of difficulties, malleable iron fractures may be quickly and easily repaired and the joint will be strong and satisfactory if the work

iron. This flame carries a small excess of acetylene gas.

Malleable iron castings are treated about the same as cast iron with regard to expansion and contraction. Also as regards cleaning, grooving, clamping, preheating, etc. The edges of the fracture must be chamfered if the metal is over an eighth of an inch thick; all dirt, paint, or grease should be cleaned away from the edge of the groove or fracture.

The broken parts should be clamped together when the nature of the job is such that there is any danger of mis-alignment. The castings should be preheated to prevent cracking upon cooling; the preheating also tends to lower the cost of brazing, the same as it cheapens the welding process.

Comparatively few parts of a modern automobile are now being manufactured

of the metal may be easily estimated through comparison.

First, the edges of the break of both pieces were ground away on an emery wheel until when placed together the chamfering formed a groove as wide at the top as the thickness of the metal in that section, extending to within a hair of the bottom of the metal in the break. As is the case with cast iron, steel, aluminum, and other metals, this grooving was to permit the torch operator to fuse the full depth of the weld.

While grooving the fracture the repairman also cleaned a space back from the edge of the groove an inch or more. This was done with the emery wheel and a wire brush for the purpose of preventing any chance of foreign substance from interfering with the brazing.

The next step consisted of clamping the

two parts together to insure perfect alignment, or to help keep the casting from warping or drawing crooked while preheating and welding. This clamping was accomplished by obtaining a disc or washer of iron that just fitted inside of the large or bell end of the housing. Through a hole in the center of this disc a long bolt was placed which extended through the housing. Two bits of flat iron were screwed tight under the nut of the bolt to hold the small broken part firmly in place.

Fig. 2 shows the arrangement of the nut and pieces of flat iron. This picture also gives a good idea of the amount and extent of grooving. The position and arrangement for preheating, which is the next step but one in the process, is also indicated in this picture.

The firebricks were walled all the way round the job when it was ready to heat; they were removed before the photograph was taken to allow the clamping arrangement and preheating burner to be seen clearly.

The burner employed was a specially constructed natural gas affair; it is shown directly beneath the small end of the housing.

Before the preheating was started, or, rather, before the casting was leveled on the welding table it was spot welded, perhaps we should say spot brazed, in three places to help insure alignment. The spots were attached while the casting stood on the bell end in a vertical position. This spotting permits a freer handling of the casting but must be accomplished very rapidly because if one of the spots cool first it may pull the casting crooked. A spot weld consists of a drop of metal usually connecting two parts of anything to be welded or brazed.

When the housing was ready to braze it was set on the welding table as described and illustrated, the gas burner was lighted under it. Now many repairmen do this kind of work without preheating, but it is advisable at all times for several reasons. It saves time and welding gas; it prevents the possibility of cracks when the bronze cools, in case the joint is rather weak, and aids in making an even joint throughout. It makes the expansion and contraction work together.

This housing was heated under covering of asbestos paper until it was red hot, just a dull all over red. Then the torch and bronze rod were brought into play. First, the end of the rod was heated and dipped in the flux powder. While doing this the flame was sprayed back and forth across about half an inch of the groove, raising the heat of this part to a bright red. At which stage the fluxed rod was brought in contact.

The heated half inch of filler rod was melted and spread over the almost melting half inch of the groove. Then the rod was re-fluxed, meanwhile the torch was played over another half inch of the

groove. The entire groove was thus filled half an inch at a time. Each additional bit of bronze was pushed against and melted into the preceding bit. A large tip and medium-filler rod were employed so that the groove was over-filled with bronze when the job was done as is indicated in Fig. 3.

In this photograph will be seen the manner of lapping the bronze over the edge of the groove in the casting to reinforce the brazed joint.

During the process the flame should not be allowed to come in direct contact with the metal, nor should it be allowed to remain motionless over any part of the joint longer than a second or so. It should be kept playing around in tiny circles or swinging back and forth across the melting metal. The work should progress as rapidly as possible until the repair is complete.

Only the bronze is melted. The malleable iron is never more than white hot; a bright red is usually sufficient. When the malleable iron starts to melt a small amount of sparks will fly, similar to steel, but not so many nor as rapidly. If sparks start the welder should reduce the temperature by drawing the flame back from the metal.

The brazing on the job illustrated was started at one side of the square opening and worked around to the other side in the manner given above. The filling started at a point opposite the welder and was worked toward him, turning the casting over as the speed of the brazing required, in order to keep that part of the groove nearly horizontal.

It often helps in brazing to sprinkle a quantity of fluz along the groove in advance of the filling. This flux melts and prepares the groove in advance. But the welder should not trust to this alone and neglect to dip the filler in the flux powder as it is applied to the groove. By properly heating the surface of the fracture and properly fluxing the joint, the average welder should have no trouble to braze a common axle housing.

An expert can make a brazed repair that looks neater and cleaner than a welded job. The bronze may be added in waves that are truly artistic in appearance. This, however, requires some experience.

The Squeak-and-Rattle Man Tells How He Got His Name.

By C. M. Adams.

You needn't pull that loud ha-ha, like your brains was emery dust. Laugh ahead. But all the same, I'm an auto specialist. I know I ain't an engineer or a lubrication hound; or one of them ignition birds that's always testin' 'round. I know I'm wearin' overalls that's greasier'n a pan. But all the same, and don't forget it, I got my line. I'm a squeak and rattle man.

I'd been mechanicin' around, for several years and more; fixin' lights and grindin' valves; doin' all the chores. I knew a carburetor float, and how to take up brakes. I'd soothed the storage battery's pains, and the differential's aches. But I didn't have no specialty; not even fixin' fans—till Bill discovered I was the squeak and rattle man.

O' course 'twas Bill discovered it (Bill Foley, he's my boss, and a squarer, sharper motor man you'll never come across). A bird comes in in a swell big six, and he howls, "I got a squeak that's got t' be fixed or I'll go wild. I've had it for more'n a week." Bill points to me and says to him, "Here's the bird that can. He's our highbrow specialist, our squeak and rattle man."

He laughs. I laughs. The bird laughs too. Took it all for a joke. But when I did start in to work, you ought t' see my smoke. 'Course I was mostly lucky then, 'cause I'd never fixed another. But when I quit, that bird turned around, like I was his long-lost brother. "I'll tell the world, you're good," he says. "That's the best she ever ran. You win. You can hang your shingle out, as a squeak and rattle man."

That made me think. I always knew I couldn't stand a squeak. I'd hunt one down in my old Ford, if it took a whole darned week. Now I saw that most folks' nerves was bothered just the same, and here was a chance for me to shine, in my own little game. Why not? There wasn't a bird in ten, that could figure the lay of the land. Why not, a regular specialist—a squeak and rattle man?

I took his word. I started in and just made that my line. I studied and schemed and worked at it, till I got it all down fine. I figured how windshields, rods, and nuts, made such an awful clatter; and how a spring could howl as if something terrific was the matter. I made it all a specialty. From the bottom I began. And now I'm an expert sure enough—a squeak and rattle man.

Does it pay, you say? Well you ought to see 'm comin' from miles around, in trucks and flivvers and limousenes, of all the models that's found. It seems that everybody hates a noisy rod or spring, as much as I do; and I know it's a most tormentin' thing. They come and come from everywhere, in speedsters and sedans; till they have to wait their turn to see the squeak and rattle man.

Bill raised my pay. He says to me, "It's only right I should, we're gettin' customers every day, because your work's so good." He fixed a separate working space on purpose just for me, and gave me a boy and set of tools, as fine as they can be. So here I am—nothing swell or fancy, understand; just a useful, every-day-payin' specialist—a squeak and rattle man.

How to Make the Shop Profitable

Some of the Dealers' Customers Complain of Distance Needed to Drive to Central Service Station and Four Branch Shops, Located at Widely Separated Points, Are Established but Closed Later Owing to Losses

By E. B. Hinrichsen

While the consolidated shop was located in practically the center of the city, there were, a good many complaints from customers on account of the distance from them. It was true that it was somewhat inconvenient for those on the edge of town but the site had been selected with the object of serving all equally and on the theory that all of their customers would come to the business section for their service.

A number of independent shops had sprung up, especially in the residence districts, and some of these took away quite a slice of the business for a time. This worried Mr. Brown and some of the dealers to such an extent that the subject of branch shops was first taken up at one of the meetings and after several conferences the new project was approved.

Some of the dealers claimed that their customers in certain neighborhoods stipulated that their service should be given by some shop in their immediate vicinity. These dealers declare that they had lost sales by not being able to comply with these requests. This seemed reasonable and it was decided to open four branch houses, one in each general direction. Bill did not seem to think much of the scheme but Mr. Brown was for it. So it was finally agreed that a test seemed to be the only way of determining whether or not the plan was good.

Bill picked out and trained four foremen and crews. An office man was assigned to each branch. The general operating methods and practices of the main shop were modified to theoretically work on a smaller scale, the only difference being that each individual had to handle several jobs.

The office man had to be bookkeeper, bill clerk, cashier, parts man and accessory salesman. The foreman had to be foreman, preliminary and final tester and also keep an eye on the stock room.

The plan was due to fail from the start. The overhead was enormous. But of the four foremen only one really qualified.

Only two of the office men were able to keep up and these did it by working night and day. Bill also worked enough for three men. We kept driving from one place to another, directing instructing and even helping with the actual work when the branch seemed about to be swamped.

With all this and with the best supervision they could give to them, the branch shops never paid and to the surprise of everyone except Bill they were not pop-

ular. The very customers who had wanted them most did not really patronize them. They would stop for gasoline and oil and perhaps for minor adjustments or small accessories. But every time when they really wanted anything worth while they would drive straight to the main house.

Bill never kicked and gave the best that was in him. But after about three months, however, Mr. Brown threw up his hands. The dealers were complaining more than ever. Their customers were trying to get service from both the branches and main shop. It was impossible to carry a full line of parts and accessories at all of the four branch shops. The lack of complete lines made it necessary to be continually sending down town to headquarters, which was not only expensive but caused serious delays and resulted in much grumbling from customers.

"I am in favor of closing all of the branch shops," Mr. Brown said at one of the meetings about this time. "The only reason for not doing it is because the independent shops will take away a good deal of business that is rightfully ours.

"We don't want to be hogs," he continued. "But we believe we have worked out a plan that will prove itself to be of as much benefit to the customers as it promises to be to ourselves. I hate to give it up."

The other dealers in the organization had become convinced that the branch shop plan would not work and so were willing to drop it. A statement of the various branches' business had been read and it showed a considerable total loss. Bill finally clinched the matter by pointing out that the independent shops were always changing hands and that there must be a reason.

"And the reason is" he said, "that they are not making a go of it. We undersell them on accessories and do not give them any discounts on parts. We are doing shop work at as low a rate as it can be done and if they are doing it at any less they are losing money.

"Lots of chaps think there is a big chance to make easy and big profits in this game until they try but they usually get their fingers burned. When a garage service station or repair shop begins to change hands often, it is a pretty good sign that something is wrong. Take away the profit on sales of accessories and parts and you will do well if you break even.

"Of course one or two good mechanics

can rent a small place and by doing the work themselves can make good wages but that will not hurt us. Let the other fellows alone and sooner or later they will have to close their doors."

This settled the matter and the branches were closed. It was their first serious mistake and caused a heavy loss but not the last one by any means.

Would Not Be Without "American Garage & Auto Dealer."

Wilkes-Barre, Pa., July 23, 1919.

American Garage & Auto Dealer.

Gentlemen:

Enclosed find remittance to renew my subscription. Am sorry this was overlooked because I would not be without your magazine. My being in the Army was the cause of the delay in promptly remitting. Trusting you will excuse the delay and thanking you for sending the past numbers, I remain

Respectfully,

(Signed) M. C. GARTNER,

Heights Garage.

"Let's Go" Is Name Selected for Advance House Organ.

Many concerns use a house organ to keep their names, products and doings before their customers. The Advance Automobile Accessories Corporation has just started a new publication of this kind and has selected "Let's Go" as the title for it. The intention of the Advance organization is to have it attractively printed and decorated.

"Its pages are filled with a bright, happy 'let's go' spirit," was the comment of one prominent dealer. The verdict of a big jobber was "it is the cleverest house organ I have ever seen, the editorial contents are interesting as well as instructive." "Let's Go" is intended for circulation among jobbers and dealers. Any tradesman who has not received his copy can obtain one by writing to the Advance Automobile Accessories Corporation, 56 E. Randolph street, Chicago, and mentioning the American Garage & Auto Dealer.

The Truck Driver.

"The truck driver must be considered," declares Charles Granger, factory manager for the Commerce Motor Car Company. "A tired driver is not efficient. You must provide the driver with a comfortable seat, good riding springs, pneumatic cord tires, a convenient handy gear shift and keep his mind off adjustments."

Has Vacation Car for Hunting Trip

St. Louis Manufacturer Builds Special Body as Traveling Home for Four Persons in Order to Take Living Quarters With His Party into the Wilds in Search of Game—Brother Makes Smaller Edition of Original Vehicle

By L. C. Blake

The much mooted question as to whether an automobile is a passenger or a pleasure car, certainly does not arise in the case of the vacation car shown in the accompanying illustrations.

The vehicle was built in the Curtis Pneumatic Machinery Company's shops, St. Louis, for the personal use of Vice-president G. F. Steedman and family. It enables him to take a much needed vacation, after almost two years of constant application to the munition contracts which the Curtis concern completed for the American and British governments.

The chassis is a Dorris "6-80" with a heavy duty ambulance type rear axle, otherwise standard as to gear ratio and equipment, fitted with 35x5 tires. The body and its equipment were made in the Curtis shops, under the personal supervision of Mr. Steedman and his brothers, E. H. and J. H., president and vice-president, respectively.

A smaller edition of the car, on a Ford truck chassis, has also been built for the president, E. H. Steedman.

The great trouble in going on a hunting trip has been, heretofore, that the best hunting is always furthest away from civilization, and where the game is, there are practically no accommodations anywhere near. With such a car as this, the accommodations are carried right into the wilds and headquarters made in the lair of the game itself.

The vacation car is built with the idea of being a traveling home for four persons,

although strictly it has a seating capacity for eight. The cushions, which form the long seats in the daytime, make up at night into two full-size double beds. The backs of the seats have folding legs, which make

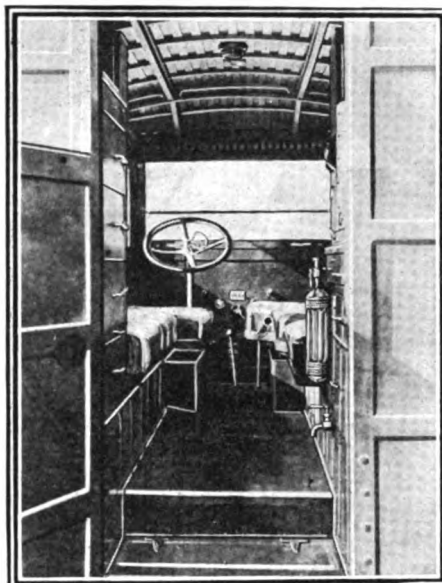


Fig. 3—General View of the Interior of the Vacation Car, Showing Instrument Board, Cushions, Fire Extinguisher and Dome Light in the Ceiling.

them into upholstered camp chairs. Inside Palm Beach type sunshades and outside storm curtains are provided, the sides of the car folding down and the storm curtains completely enclosing same at night, as

shown in Fig. 2. Mattresses and complete bedding equipment is carried under the long seats. The third view shows one of the beds "made down" as George, the Pullman porter, would put it. In the rear of the car are placed three full-size lockers with coat hangers, four large individual wardrobe drawers (one for each person) with chiffonier top and mirror over the drawers, to say nothing of the individual mirrors in the clothes lockers. There are also, dining room table, seating four; a three-burner gasoline stove with pressure feed system, carrying 20 pounds air pressure, an oven, a portable kitchen sink and drain, a kitchen cabinet, an ice storage chamber, a disappearing bread board, a pneumatic water system with 30-gallon storage tank for drinking water purposes, with outside overflow, a gun locker, a tin-lined game locker, broom, mop, laundry equipment and portable foot bath.

The vehicle is also equipped with a complete lighting system, having interior dome lights, portable reading lights and electric fan, this being entirely independent of the ignition system of the car.

The roof of the car has adjustable ventilators and on top is provided a canoe rack. On the outside of the car are carried the two spare rims and tires, completely inflated, portable hand acetylene lanterns and fire extinguishers. The power plant is equipped with a power air compressor for tire inflation purposes and to supply the air pressure for the water system and for the
(Concluded on page 54)

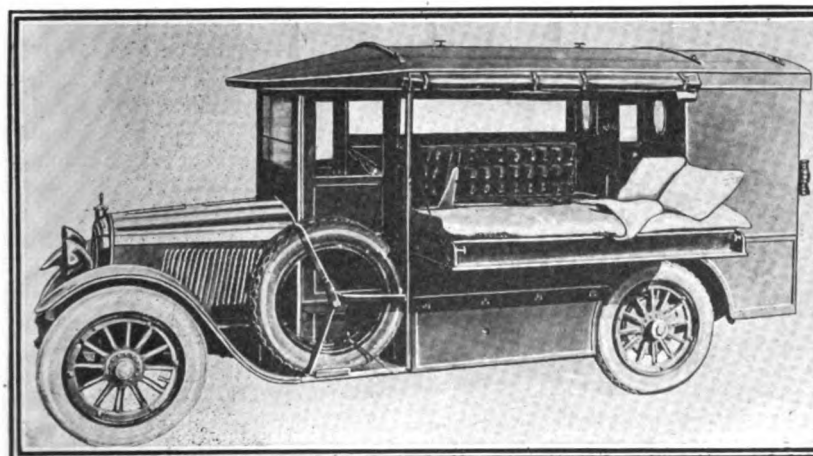


Fig. 1—This View Shows One of the Car Sides Lowered into Its Position for Use as a Sleeping Place, With the Bed Arranged. The Curtains That Are Lowered at Night Are Shown Rolled Up Above the Bed.

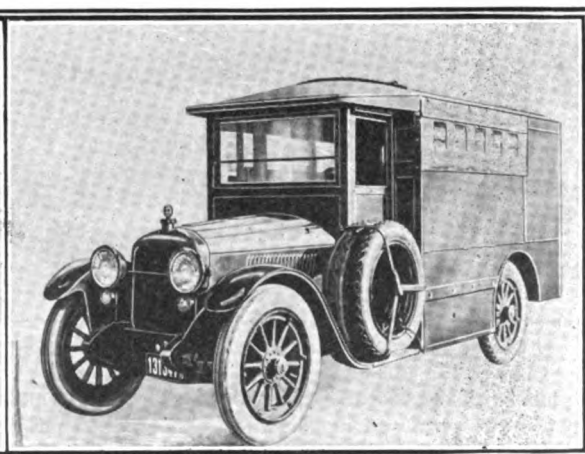


Fig. 2—Mr. Steedman's Vacation Car With the Sides Closed and the Vehicle Ready to Take the Hunting Party into the Wild for Game.

Practical Hints for Shop Mechanics

By G. L. Shelley

To Transfer Battery Acid.

Some difficulty may be experienced when transferring battery acid from a carboy to a shock container, especially so if it is necessary to tip the carboy for this purpose. It is possible, however, to force out the acid to a desired amount by the use of air pressure. Fit a bent glass tube through a cork which is placed in the mouth of the carboy and extend it to the bottom. Then place another bent glass tube through the cork, through which pressure can be applied to the surface of the acid with the aid of a common foot pump or with an ordinary hand pump.

* * *

Cylinder and Manifold Paint.

Paints which will resist heat can usually be obtained from supply houses. If not, and the mechanic wishes to mix it for himself he might try the following:

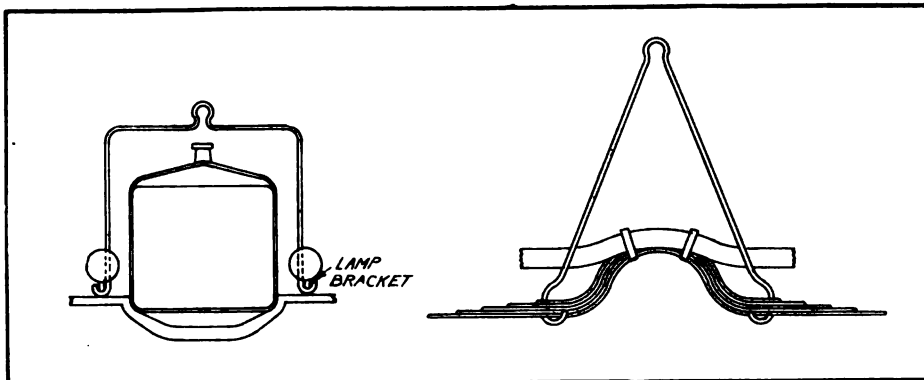
For cylinders, 8 ounces of white lead in oil; 6 ounces of boiled linseed oil; 2 ounces of turpentine, and $\frac{1}{2}$ ounce of lamp-black. This mixture should be enough for a six-cylinder engine. If found to be too heavy it can be thinned with turpentine.

For the exhaust manifold, about the best thing to be used is aluminum powder mixed with bronzing liquid. Even this, however, will peel off in time, as it is claimed there has as yet been no paint found which has the quality of remaining on exhaust pipes for any length of time.

* * *

Lifting Tackle for Fords.

When it is desired by the mechanic to work on the wheels, front axle or steering gear of a Ford, the car can be raised from



A Simple Method of Removing Bodies from Ford Cars by Two Hooks and Tackle.

the floor with the use of double hooks, as shown in the accompanying drawing. The hooks for raising the front of car should be constructed from a strong bar so shaped that one can lift the car by its lamp brackets. The hook used for lifting the rear of the car can be made from an old Ford drive shaft, which is easy to attach,

raising the car by the rear springs. The use of this double hook, if correctly shaped will not mar the paint in any way.

* * *

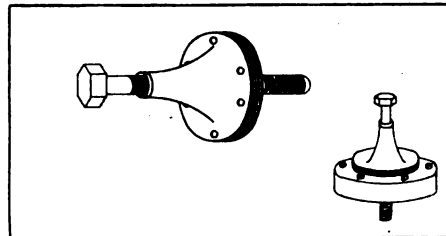
Straightening Bent Axles.

In straightening an axle that has been bent, particularly when made of nickel steel, the mechanic should take considerable care in heating the metal. To straighten, it is advisable to heat to a cherry red and then straighten; if heated to a hotter degree than a cherry red, the nickel will be taken out of the steel.

* * *

Wheel Puller Tool.

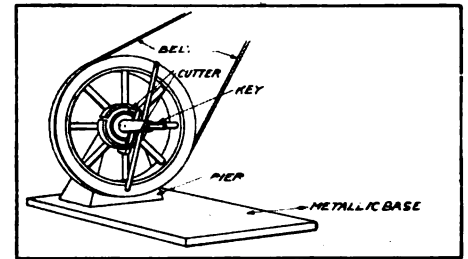
For cars having the driving flanges bolted in place a most efficient puller for the rear wheels can be contrived with the use of one of these flanges and a large



Tool for Removing Rear Wheels.

screw threaded through the center of the hub. Bolt the flange onto the wheel and it will be found that by turning this tool the wheel will be pulled off. If it is desired to make a puller which can be used on two different sizes of wheels, apply an extra sleeve which is threaded to the outside of the ordinary puller. With this

wheel, especially when the inside and outside of combined internal and external brake drums are to be worked upon. This is not necessary with the aid of a tool as is shown in the accompanying illustration.



Device for Truing Brake Drums.

Use a substantial piece of metal about 20 inches wide for the base and attach to this a heavy wooden pier; a horizontal arm the size of the wheel bearing holes should be mounted onto the pier, the wheel placed on the arm and resting upon these bearings. Be sure that the wheel is securely locked in place.

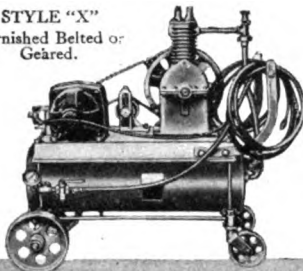
The next step is to construct a cutting tool, which should be a double arm, the tool for the outside of the drum mounted on one end and the tool for the inside mounted on the other end. The center of this arm should be attached to a heavy casting, bored out sufficiently so as to slide over the shaft. In this casting there should be a key to fit into a keyway in the shaft. This arrangement, it can be readily seen, will prevent any possibility of the tool moving around. After this has been completed, slip a belt over the tire. Then the cutting tool can be fed in very gradually by turning the nut, which meshes with the shaft threads.

* * *

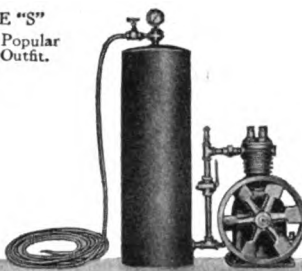
Fluid for Soldering.

An excellent soldering fluid can easily be made by the most inexperienced repair-shop hand. Collect scrap zinc from old dry cells, a few pieces of which should be placed in an earthen jar containing muriatic acid. Caution should be used, and the work done in open air, for the reason that a violent chemical action takes place giving off fumes which are very injurious to the lungs, and will corrode any bright metal work which may happen to be nearby. Enough of the zinc pieces should be added so that after the action is completed there will remain in the bottom of the jar portions of the pieces, and the fluid is then ready to be used. The mechanic should bear in mind that this fluid should not be used when soldering electrical work as it sometimes causes a resistance that is injurious. Either rosin or a special soldering paste is better to

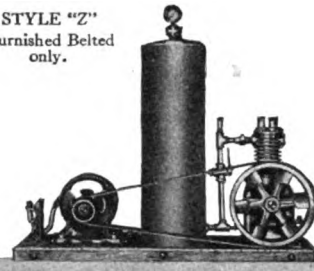
STYLE "X"
Furnished Belted or
Geared.



STYLE "S"
Simple, Popular
Belted Outfit.



STYLE "Z"
Furnished Belted
only.



The Curtis Sign is 10 x 14 inches—baked enamel on steel. It is furnished FREE with every Curtis Garage Air Compressor and cannot be obtained in any other way.



Conserve Your Patrons' Tires

Motorists will go a long ways to find the Curtis Sign and get Curtis Air—FREE FROM OIL—because it means less blowouts and greater tire mileage.

CURTIS Air

Free From Oil

Because of correct design and good construction, Curtis Garage Air Compressors are dependable and operate with minimum power. The patented and exclusive self-regulating splash oiling system prevents oil from getting into the air line. The air is pure, clean, safe and FREE FROM OIL.

OTHER CURTIS FEATURES

Fan flywheel cools cylinder. Valves of light weight and large area. Hand unloader permits starting against full tank pressure without injury. Large drop-forged crank shaft. Adjustable, renewable, die-cast, non-cutting bearings. Head removable without breaking pipe connections—only one gasket.

MADE IN VARIOUS SIZES

Curtis Compressors are made in various styles and sizes to suit your special needs. Write today for illustrated literature giving full particulars. Use the coupon.

CURTIS PNEUMATIC MACHINERY CO.

1515 Kienlen Ave.,
St. Louis, U. S. A.

Branch Office:
530-U Hudson Terminal,
New York City.

Curtis
Pneumatic
Machinery Co.
1515 Kienlen Ave.
St. Louis, Mo.

Gentlemen:
Please send me full details
on Curtis Air Compressors—
your proposition and prices.

Firm Name.....

Address.....

Jobber's Name.....

Address.....

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

use in this kind of work. If soldering copper it should first be tinned, which will make the work much easier and often make unnecessary the use of a soldering iron.

* * *

Effect of Oil on Tires.

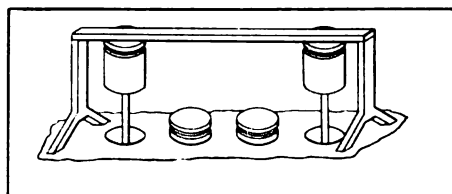
Every garage owner should bear in mind that oil and gasoline are deadly enemies to automobile tires, and should be very careful that no pools of oil are allowed to stand on a garage floor where a tire may come in contact with them. We suggest to any one who may be of a different opinion that he immerse a small piece of rubber in gasoline. He will see it swell, and after soaking for a time if he will try to stretch the rubber he will see that there is no life left in it. Naturally, gasoline will have the same effect upon automobile tires—causing a weakness in the tread or side wall, thereby starting deterioration.

The effect of oil and grease on tires is the same as gasoline. We might add in regard to oiled roads that it has been proved by experts that the injury to tires is scarcely noticeable when driving over roads in which the oil has had time to work into the road surface. But if passing over a newly oiled road the motorist should take immediate steps to remove any oil that has adhered to his tires, which can be done by wiping the tire carefully and then sponge with gasoline. Owing to the porous nature of rubber any light lubricating oils have a very bad effect upon tires, as the oil is quickly absorbed, producing a chemical change which makes the rubber weak, though this effect is seldom noticed at once.

* * *

Tool for Aligning Pistons.

The mechanic who is called upon to overhaul motors can construct a very useful tool which will determine whether or



Simple Apparatus for Aligning Pistons.

not the pistons are in line. Use a perfectly straight bar of steel and support it by two uprights of sufficient length that the pistons will just touch the bar when on dead center. The accompanying illustration shows the position of the two pistons of a four cylinder motor on dead center.

* * *

A Furnace for Soldering Iron.

Every shop is called upon at times to turn out work requiring the use of soldering iron. When heating by gas is availa-

ble a furnace of sheet steel is advisable and can be made at a small cost. Into a box of about 5 x 8 x 12 inches, with a large square hole cut in the front for allowing the irons to be inserted, and a vent in the top to permit escape of the products of combustion, insert a 3/4-inch gas pipe drilled with twenty-five or thirty 1/16-inch holes, which is intended for the burner. The gas pipe lead should be securely connected with the gas pipe burner.

* * *

Valve Seat Test.

A very good method of testing valve seats is to loosen the valve spring and apply on the face of the valve Prussian blue, which can be obtained at any paint store, and then turn it one-quarter around in the valve seat. If the result is a clear line of blue it will be found the

ONE DOLLAR EACH

Each shop hint and illustration printed in this department means one dollar to the person sending it in. You have some time or labor saving ideas which you know are thoroughly practical. Tell us about them in your own language. Write out a brief description, with a sketch if necessary, that is all we require. We will fix up the sketch for reproduction, a finished drawing is not needed, simply a free-hand sketch. You get a dollar if the idea is worth publishing.—American Garage & Auto Dealer, 116 S. Michigan Ave., Chicago, Ill.

valve fits perfectly; but if there are places noticeable where the blue does not touch, then you may be sure that the valve is worn or warped or has a faulty seat.

By reversing the above operation and applying the Prussian blue of the valve seat and repeating the one-quarter turn, the valve seat can be tested. If points appear where the blue does not touch, then both valve and seat are faulty, and should be corrected at once.

* * *

Precautions When Burning Carbon.

A possible fire when burning out carbon can be prevented, the importance of which should not be overlooked by mechanics. Be sure that all traces of gasoline are removed from the carburetor, intake manifold and cylinders by shutting off the gasoline and then turn the motor sufficiently so that all fuel remaining in these parts is consumed.

* * *

Spark Plug Threads.

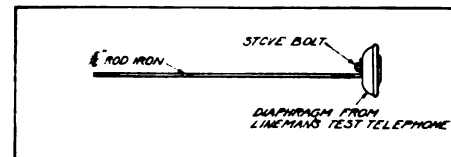
When placing sparkplugs, the operator should not fit them so tight in the cylinder that they cannot be screwed in with the fingers for at least two-thirds of the thread, else there is a possibility of a poorly cut thread jamming tight. The threads of

sparkplugs, as well as valve port caps and exhaust pipe connections, should once in a while be gone over with powdered graphite. This will prevent binding of the threads from the oxidizing effect of hot gases.

* * *

Another Motor Stethoscope.

A very good motor stethoscope can be made of cast-off materials. Take a two



An Easily Made Stethoscope.

and one-half foot piece of five-sixteenths iron rod, bend one end and flatten it out.

Drill a hole in the flattened end through which to fit a quarter inch stove bolt. Then obtain a diaphragm from a telephone, used by linemen, and attach it to the rod by the stove bolt. I have used such a stethoscope in repair work for five years and never found one better.—J. P. Ledwidge, Tacoma, Wash.

* * *

Hub Puller.

When the rear-wheel hubs flare out, particularly with a semi-floating or three-quarter floating axle, it often happens that the hub is difficult to pull out. A convenient form of tool for this purpose can be made of a rectangular form of strong steel with the jaws hooked over into the neck of the hub, with a bolt screwed through the center of the tool against the hub, so that by turning this bolt the hub will be forced out.

* * *

Cleaning Celluloid Windows.

Automobile curtain windows of celluloid can be restored to transparency by the use of the following ingredients:

| | |
|--------------------|-------|
| Acetoin, U. S. P. | 4 oz. |
| Alcohol | 2 oz. |
| Flexible collodion | 2 oz. |

* * *

Charging Dynamo Run from Shop Engine.

Inasmuch as battery charging is usually done at night and the shop engine must be run anyway, considerable saving in expense can be realized by using the engine not only to drive the machinery but to charge batteries, and light the garage as well. This can be done by simply using twin flywheels, and mounting the lighting generator and battery charger on the same base. This will enable the garage man to place a belt over each flywheel and thence to each generator. One can readily see that this contrivance will prove not only convenient but economical as well.

When Springs Break

put on **VULCAN**
The Replacement Spring




This Display Rack FREE with First Order

VULCAN springs represent the highest degree in quality and fit, a remarkable and growing popularity with car owners, and a highly satisfactory PROFIT for the dealer.

Write for our Proposition.

Jenkins VULCAN Spring Co.

Factory Richmond, Indiana

Direct Factory Branches

| | |
|---------------|--------------------|
| Atlanta, Ga. | Minneapolis, Minn. |
| Boston, Mass. | Sumter, S. C. |
| Dallas, Tex. | Reading, Pa. |
| | Kansas City, Mo. |

**IN EVERY TOWN
for EVERY CAR**

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

NEARLY TWO
MILLION DOLLARS WORTH OF WHEAT
WAS HARVESTED IN THIS COUNTY
THIS SUMMER

OVER 50 COAL MINES
IN SULLIVAN COUNTY
PRODUCE ABOUT
10,000,000 TONS
YEARLY

THE COUNTY
HAS ALSO MANY PRODUCING
OIL WELLS & A SEEMINGLY
INEXHAUSTIBLE SUPPLY OF
NATURAL GAS

**SULLIVAN
COUNTY
INDIANA**

**back of
MU**

THE LARGEST SILO IN THE WORLD
IS IN SULLIVAN COUNTY — A
COUNTY FAMOUS FOR ITS PRIZE
WINNING LIVE STOCK

NO exclusive truck company, that we know of, started its business life under such favorable auspices as ours.

A wealthy, but conservative, community was won over to the big idea of backing this new industry, not by any dazzling promotion methods, but by the quiet earnestness of a fellow-citizen who knew he was right, and who kept patiently telling his story for more than two years.

Bankers, farmers, stockraisers, merchants, lawyers, local coal mine and oil well owners—solid citizens of the county, finally became convinced that the way to make their community an industrial center was to build something better than it had ever built before; and to offer it at a price that would give the buyer more for his money than he could get anywhere else.

The idea of building "America's Greatest Truck" appealed to them as the surest way of making Sullivan the home of America's greatest truck Company—and with that enterprise other industries, in the same or other fields.

So, the Mutual Truck Company starts into business with ample working capital; with a new plant fully paid for; with a motor truck which IS "America's Greatest Truck" and with as many millions of local capital back of it as are necessary to build any number of Mutual Trucks and to carry out national, vocational and local advertising campaigns, which will so win and hold the attention of prospective truck buyers, that "Mutual" dealers will soon be in command of the high-class heavy-tonnage truck business of their localities.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

A Whole Rich County

its Only Industry:

MUTUAL

"AMERICA'S GREATEST TRUCK"

Built wholly from units and parts that have proved themselves to be the *Masterpieces* of the truck industry.

Specifications 2-Ton Mutual Price—Chassis—\$3,375.00

Engine—Wisconsin UAU four-cylinder 4¼ x 6, SAE Rating, on bore only, 29 h. p. Actual power, calculating both bore and stroke, 39 h. p. at 1000 rpm. Most other high priced 2-ton trucks use 4 x 5½ motors rated at 25.6 h. p. Wisconsin was selected, because an exhaustive study of all makes convinced us that it was "America's Greatest Truck Motor".

Clutch—Hele-Shaw—Universal No. 5 with Multiple grooved plates running in oil. Remarkable for its smooth, regular pick-up and firm final grip; its ease of operation and wear-defying long life. Costs us two to three times as much as clutches used on most other high priced 2-ton trucks.

Universal—Spicer—Highest priced and universally acknowledged to be the best. Three joints in the shaft and one in the Universal clutch.

Transmission—Fuller, Model G-5, mounted amidships; 4 speed forward and reverse. How many other trucks offer four speeds?

Some high class trucks have SOME of the above super-specifications; but no other truck in America offers all of them, or corresponding parts of equal merit or equal cost at ANY price. The cab, electric lights, steel wheels, lubricating tank, Bound Brook bushings, electric steel castings and other features of our regular equipment, if added to the "cheapest" truck would raise its price far above that of the Mutual. The Mutual gives more for the money than any other truck. Figure it out for yourself.

MUTUAL TRUCK COMPANY, SULLIVAN, INDIANA

TERRITORY now being assigned

We shall be as critical in selecting our district and local sales representatives as we were in choosing the parts that make the Mutual "America's Greatest Truck".

But when we do make a man our agent, we back him to the limit with both local and national advertising.

In applying for territory, give bank references, population of territory asked for, and estimate of the number of high class 2-ton, 3½-ton and 5-ton trucks you expect to sell in a year.

MUTUAL TRUCK COMPANY

Frame—Parish & Bingham Pressed Steel—6½ in. channel, with 3 in. flange, pressed from ¼ in. alloy steel. We could build our own from structural steel at half the cost.

Springs—Mather Chrome Vanadium Steel. Best and cost most.

Radiator—Perfex—Cast type, three-point suspension, of our design.

Steering Gear—Ross—with 20 in. wheel. The costliest and most highly perfected type of the most famous maker.

Magneto—Bosch, ZR4, waterproof, and dustproof; with impulse starter.

Carburetor—Stromberg "M"—Latest type.

Cab—Weather-tite, whose equal no other truck maker will furnish for less than \$175 extra—is a part of our regular equipment.

Castings—Electric steel at vital points where others use malleables.

Governor—Duplex (not Simplex) type, controlling both engine speed and road speed independently from each other.

Rear Axle—Worm drive 2½ ton size, ball bearing. Highest priced axle put on a 2-ton truck.

Front Axle—Sheldon, ball bearing steering knuckle type.

Wheels—Smith Metal Wheels, for solid tires and Dayton Steel Wheels for pneumatic tires; furnished as regular equipment, tho they cost us 55% more than the best wood wheels.

Tires—Firestone or Goodyear. 36 x 4 front and 36 x 8 rear, solid tires. Pneumatic tires are furnished at a reasonable extra charge.

Bushings—Bound Brook Oilless, thruout. Eliminating oil and grease cups, and insuring constant lubrication.

Gas Tank—25-gallon capacity.

Reserve Lubricating Oil Tank—2½-gallon with indicator and feed valve on dash. No other truck has this important feature.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Advocates Federal Car Theft Law

The Registration of All Motor Vehicles with a Federal Marshal Is Recommended as Essential Part of Proposed Plan to Eliminate the Stealing of Automobiles—Millions are Lost Each Year by the Activity of Thieves

By H. C. Bradfield

Let's halt motor car thefts with a Federal law!

Cyril Arthur Player, editorial writer on the *Detroit News*, formerly automobile editor of the *Seattle Post Intelligencer*, proposes a Federal law that would protect the motor car or truck owner from this colossal evil against society—motor car thievery. He suggests a Federal statute which would compel the registration of motor vehicles, passenger cars and trucks with the Federal marshal, attorney or other official whose duty is the enforcement of Federal laws.

Mr. Player would have the manufacturer cast numbers on his various units. It would be an offense under Federal law to steal a car or truck; to try and efface or disguise such numbers; no car could be sold without it was accompanied by a Federal certificate of registration, which would be in effect the registration of a bill of sale with the Federal government.

Something must be done to halt or stop the theft of motor cars. It is costing millions of dollars and a large number of men to trace stolen motor vehicles. It increases the first cost and increases the yearly maintenance cost of motor cars. Insurance premiums have been placed at excessive figures because of such stealing.

The future indicates that unless

some protective measure with teeth in it appears that motor vehicle thefts will still further increase. Motor car thieves are occupying too much time and causing too much worry for police departments. It is teaching crime, because it has been an easy matter to steal and dispose of a motor car with punishment prospects light even in extreme cases.

Steps are under way in Detroit to have the Detroit Automobile Club and the Detroit Automobile Dealers' Association get back of a movement for such a Federal law. Both organizations will discuss it at their next meetings. A. L. Zeckendorf, Cole and Chandler dealer and President of the Dealers' organization, and G. Edward Bleil, Republic truck manager, a director of the Automobile Club, are both strong for the enactment of such legislation.

More than 5,000 letters are leaving Detroit addressed to the automobile dealers throughout the country urging that they exert their influences for the enactment of such Federal legislation. They are urged to take it up with their local dealers' organization, with the National Automobile Dealers' Association and their Congressman.

There seems to be no doubt but what the movement once started and

then backed by some strong organization in the automobile industry will result in Federal legislation being enacted. The industry itself can spell the doom of the motor car thief.

No one sees an opportunity of injuring anyone in the enactment of such a law, unless it be the organized gangs of motor thieves. Police departments in all large cities would welcome such a law.

It would be folly to quote the amount of money that is involved yearly in car thievery. Close to a million dollars if not an excess of that sum is spent yearly in tracing stolen motor cars; a large number of men are engaged in this business who could be doing something more profitable for their community.

Motor car stealing has increased insurance rates and there is every indication that unless something is done the insurance companies will be forced to further advance theft premiums.

Predictions for the future indicate that there will be a shortage of man power in the country, so much so that the national government will be forced to suggest ways and means of curtailing unnecessary labor. Men detailed to hunt motor car thieves would fall under such a ruling; a Federal law would reduce the number of men engaged in such work and give a man that kind of protection for his motor car to which he is entitled.

Congress has devoted a great deal of attention to the third largest industry when the country was in need of revenues. Some Congressman will establish himself as the champion for the large number of motor car owners in this country today.

Who gets the honor is something important politically, but what the general motoring public is interested in is assurance that motor car thievery will be halted if not stopped. If a Federal law is the solution, and this thus far seems to be the answer—then a Federal law is what we want quickly.

Mail This to Your Congressman

To CONGRESSMAN _____

House of Representatives,
Washington, D. C.

We earnestly urge your serious consideration for the enactment of a Federal Law that will establish motor car thefts as a Federal offense.

Name _____

Firm _____

Address _____

City _____ State _____



The Oro Connecting Rods for Fords

have proved that they are the very best that can be made. They stand the hardest service—never letting go. They are made from the best grade of steel—30 to 40 point carbon, drop forged. The babbitt is a scientific combination, requiring the least amount of lubrication and giving the maximum amount of wear. You'll make satisfied customers with these connecting rods. Others may cost slightly less, but the difference in quality is so apparent that business judgment dictates your using the Oro.

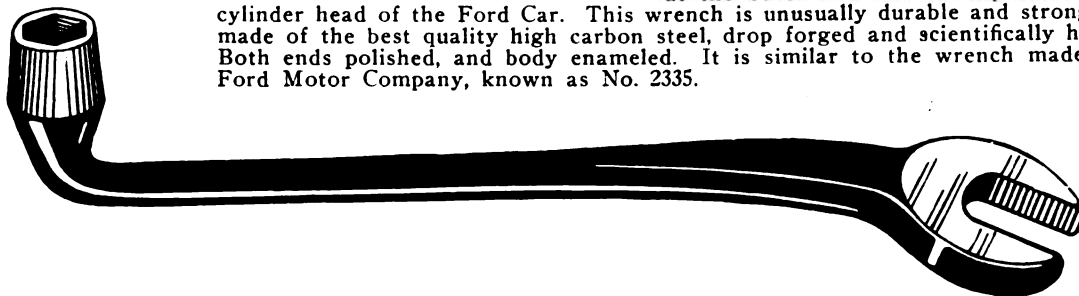
Oro
GOOD as GOLD

Oro Combination Wrench

For Spark Plugs and Cylinder Head Bolts

Fits the Champion X Spark Plugs, with which the Ford Car is equipped. The socket at the other end fits the cap screws in the

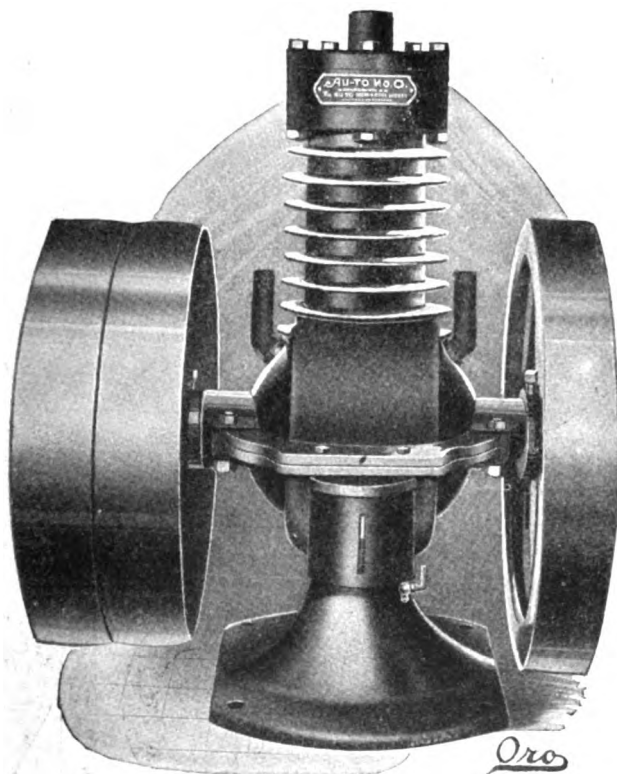
cylinder head of the Ford Car. This wrench is unusually durable and strong—being made of the best quality high carbon steel, drop forged and scientifically hardened. Both ends polished, and body enameled. It is similar to the wrench made by the Ford Motor Company, known as No. 2335.



10 Years of Success Back of this Sturdy, Reliable Compressor

This is No. 0 Au-to Compressor, one of the most popular of the world famous line of Au-to Compressors. No. 0 is designed especially for automobile garages, and will produce 6½ cubic feet of air a minute, at 300 pounds pressure. It is simplicity itself—requires practically no attention—and has nothing to get out of order. Ten years of satisfaction prove its high quality. Au-to Air Compressors are known everywhere as the best—and this is one of the most popular because of its suitability for use in the ordinary sized garage.

Write us for information regarding the complete line of Oro Automobile Accessories. They all are leaders—money makers for you!



The Au-to Compressor Company
WILMINGTON, OHIO

THE LONG WAITED FOR TIRE REMILER IS HERE

The Miller AD-ON-A-TIRE

It is a well-known fact that the tire tread represents but 25 per cent of the tire mileage value. To throw away a casing simply because the tread has worn off means that the motor car owners lose 75 per cent of the mileage they should get from their tires.

Yet, not until the Miller AD-ON-A-TIRE came, had a successful method been discovered for remiling tires and ending this enormous tire waste.

Many Make-Shifts

Of course there were many make-shift repairs. None of them, however, offered an insurance of extra mileage to warrant the repair expense.

Motorists, therefore, had no other alternative than to run on the carcass after the tread was worn off in the vain effort to get as much mileage from their tires as possible. The result, of course, was their tires quickly blew out.

The Final Type

The Miller AD-ON-A-TIRE has ended all this. With this remarkable tire remiler, motor car owners now get 100 per cent value from their tires. *Carefully kept records in thousands of cases show that the Miller AD-ON-A-TIRE cuts tire costs two-thirds.*

The Miller AD-ON-A-TIRE is built of tough buoyant rubber. It has several layers of fabric, breaker strip, tread and side wall which completely cover the tire and clinch under the rim. Once on, it becomes an integral part of the tire. And the AD-ON-A-TIRE also has the famous **Geared-to-the-Road Tread** that assures perfect traction and safety.

Now is the time to get started in this profitable business. Read on the next page, and then send in the coupon to us at once for more interesting facts.

Miller AD-ON

A BIG MONEY MAKER FROM THE FIRST DAY

Send in the Coupon Now for the Facts

EVERYWHERE Miller AD-ON-A-TIRE Dealers are making phenomenal records. One dealer writes: "The AD-ON-A-TIRE is a magic money-maker." Another writes: "All we have to do is to remile ONE tire for a car owner. From then on we remile them ALL."

Your AD-ON-A-TIRE business starts from the very first day. Once people know about AD-ON-A-TIRE, what it is and the wonderful tire savings it makes possible, you have a never ending stream of business. It is the many-year-waited-for tire remiler.

A Wonderful Market

When you consider that every motor car in your city will use from 4 to 6 AD-ON-A-TIRES each year, the wonderful money making possibilities of this remiler must be evident.

There is nothing on the market like the Miller AD-ON-A-TIRE. It is the only perfected tire remiler. Your potential sales are limited only by the number of cars in your city. Absolutely no additional equipment is required.

Get the Facts Now

Our agency proposition is one of the most liberal ever offered by any manufacturer. Besides the most attractive profits, you get letterheads, folders, newspaper advertisements, wall hangers, price lists, sales suggestions, etc.—*All Free*. We have overlooked nothing that will help you open up this wonderful market for AD-ON-A-TIRES. Clip the coupon now and mail it to us for complete information. Our AD-ON-A-TIRE production is limited and we shall only supply a certain number of dealers. To delay may mean that you will be too late. So clip the coupon NOW and get the facts.

THE MILLER RUBBER CO.

Dept. A-213, Akron, Ohio

Makers of Miller Uniform Geared-to-the-Road Tires and Miller Red and Gray Inner Tubes—Accessories and Repair Materials.



AD-ON-A-TIRE

CLIP THIS COUPON NOW

THE
MILLER
RUBBER
COMPANY
Dept. A-213
Akron, Ohio

Gentlemen: Without any obligation on my part please send me full information regarding your AD-ON-A-TIRE Agency Proposition.

Your Name

City..... State.....

I sell the following tires :

I do only tire repair work

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Readers' Questions and Answers

By G. L. Shelley

Care of Trucks in Hot Weather.

Question: Would you be kind enough to publish in your question and answer column suggestions for the operation of trucks during the hot summer weather? We are using several trucks for hauling ore from our mines to the smelter which is about 150 miles, through hot desert sand, and over long and rather steep grades. It has occurred to us that you may suggest some means which will bring about more efficiently than we seem to be getting out of our trucks during the hot months.—G. F. C., Arizona.

Answer: It is impossible for a truck to be driven in low gear up grades or through sands such as you have in Arizona if carbon deposit in the cylinders is allowed to accumulate, if the radiator is not kept properly filled with water, or if the lubricating oil level is permitted to get low.

These are the three important factors which must not be overlooked in order to get out of your trucks their extreme efficiency. Another precaution is to be sure that the carburetor is properly adjusted at the beginning of the hot summer months, at which time the mixture should be leaner than that for winter driving. Neglect of this is sure to result in overheating of the motor.

Inasmuch as timing has an important bearing on the cooling of a motor in hot climates the engine will run cooler, at a sacrifice of power, however, by setting the camshaft one tooth earlier on the timing gears, which will permit of the exhaust valves opening earlier. It is also true that a weak spark has the same effect as late spark timing and will cause overheating.

Be sure that the exhaust is kept clear and the muffler free from any mud that may take on the outside. Use the best quality of rubber hose for water connections as the inside of inferior tubing will dissolve and the particles of rubber clog the cooling system. In case you are accustomed to using anti-freeze solutions during the winter, go over all hose connections in the spring as such solutions have a bad effect upon rubber, and also leave a scum inside the radiator which must be cleaned out. When filling the radiator use only clean water, and by all means do not use pails in which oils have been kept. Keep the fan clean and well greased.

The cooling of the engine does not depend entirely upon the water system, as the bearings are kept cool by the lubricating oil, and the oil will remain cool only when the crankcase is kept in perfectly clean condition. For the reason that a certain amount of gasoline will pass from

SEND QUESTIONS

Develop inquisitiveness! The more you know about your business the more money you can make. Inquisitiveness means asking questions; the more you ask the better we are pleased.

All readers are invited to write to us when they wish information on automotive subjects. We welcome queries about cars, trucks, tractors, trailers, tires, or anything and everything sold or used by automotive tradesmen and their employees. When a quick answer is desired we will send a reply by mail, otherwise the answer will be printed in this department. Whether you are a dealer, a salesman, a mechanic, a bookkeeper, a service man or a stock-keeper, do not hesitate to send your question in and it will be answered.—American Garage & Auto Dealer, 116 S. Michigan Ave., Chicago, Ill.

the cylinder walls into the crankcase, mixing with the oil, in time destroying the lubricating qualities of the oil, about every 1,500 miles the oil should be drained from the crankcase and replaced with new. If this is not done the rubbing surfaces will not be properly lubricated and overheating will result.

It is advisable to use a grade heavier oil in the summer than in the winter, as the working temperature of the oil is higher in the summer. In unusually hot climates it may be found advantageous to use even a heavy grade of oil, but in this case take care that the engine is not worked too hard before warming up.

* * *

Caution in Mountain Driving.

Question: I am planning on driving to the Pacific Coast in the very near future, and would like to ask a few questions about mountain driving, as it will be my first experience in that part of the country:

(1) What effect has high altitudes upon the cooling system?

(2) Is it advisable when driving down a steep hill to save the brakes by using the compression of the engine?

(3) If for any reason the brakes should fail in going down a steep hill, what is the best thing to be done?—F. H. S., Ind.

Answer: (1) Water will boil at a lower temperature when in a high altitude, as the water must first overcome the pressure of the atmosphere before coming to a boiling, or steam, point, and, of course, the pressure is lower in a high altitude. It has been proven that water will boil at a temperature 10 degrees lower, at an elevation of 5,000 feet than at sea level. You will find in crossing the Rockies the road is frequently a mile or more above the sea level and that the water in your cooling system will boil away very rapidly, and it may be necessary occasionally to carry in desert water-bags an extra supply of a few gallons of water, unless you are absolutely sure to find plenty along the road.

(2) It may be well when going on a trip, such as you plan, to have provided on the inlet pipe an extra air valve which should be open, and the throttle closed, when using your engine as a brake. The reason for this arrangement is that when used as a brake the engine should draw in pure air and not mixture, as this is most wasteful and is just the same as having the engine run at full throttle all the time. There is no doubt that when using the engine in this way there will be prevented a great deal of wear and tear on the regular brake shoes.

(3) Nine drivers out of ten will coast down hill, meaning of course that he will throw out the clutch and thereby disconnect the power from the rear axle. He will instinctively slow down the engine as he will not care to hear it race, therefore his engine will be running slow and idle and clutch out coasting. In case it is necessary to stop in going down a steep hill, and the brakes have failed, immediately throw off the ignition switch and let in the clutch. This naturally will check the car because there will be no power stroke to propel it, and the piston in traveling upwards on the compression stroke will meet a resistance in pressure. This pressure is known as "held back on compression."

* * *

First Power-Propelled Vehicle.

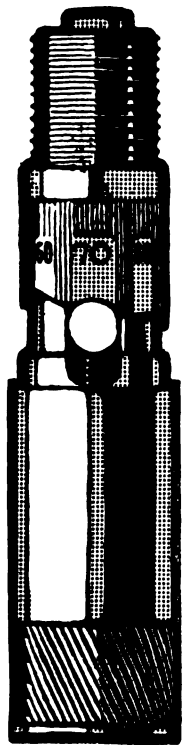
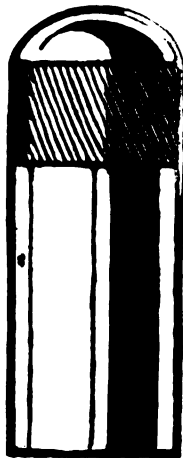
Question: I am very curious to learn in what year the first power-propelled vehicle was invented. If you are in position to give me this information I will watch for same in the question and answer column in your next issue.

Answer: It is not generally known, but is a fact nevertheless, that the first

save

60%

on tires



Here it is—
screw it on

WHAT causes from 50% to 75% of all tire trouble? Over—or under inflation.

Over inflation stretches the tire, causing blowouts, blisters, etc. Under inflation causes rim cut, fabric breaking, etc.

Stop wasting your tires! Equip with the Automatic Pressure Regulator and you can't make a mistake. With this safety valve on your tire, you can start the air going in until a cheery whistle announces that the tire has enough. No time lost using a pressure gauge.

How does this strike you as a sales proposition? Did you ever hear of anything in the accessory business that had such a great chance of going over—*big*?

There are five million pleasure cars in America. The majority of owners will jump at an opportunity to save 60% on tires. *You'll* get their business—their friends' business and the satisfaction they'll get will make them your customers for good.

We furnish the advertising and dealer helps. Ask your jobber or write us about our generous proposition today.

The Automatic Safety Valve Corporation

1765 Broadway, New York City

Automatic Pressure Regulator

"It Whistles When It's Had Enough"

automobile was built in 1770 by Cugnot, a French engineer. This automobile was so constructed that it could haul $2\frac{1}{2}$ tons at the rate of three miles per hour. This vehicle is still on exhibition in France.

The first steam automobile was built in 1802 by Trevitluek of England. In this case there was used for the first time a crankshaft, and the vehicle was driven by gears from the engine to the road wheels. The first vehicle which had any semblance toward comfort and with a coach design of body, with seats supported on springs, was built in 1821 by Griffiths of England. England is again to be credited with the first three-wheel tubular boiler and two-cylinder engine, built in 1831, and capable of a speed of thirty-two miles per hour.

Another Englishman, Walter Hancock, is to be credited with the first motor vehicle which could carry passengers. This vehicle was constructed in 1834, and the motive power was steam.

* * *

Testing of Chassis.

Question: Different occasions have come up calling upon my mechanics to test both motor and chassis. I have made inquiries and find that to do this work it will be necessary for me to install an apparatus, and that the expense of such is considerable.

It would seem to me there are many advantages when the chassis is tested in a shop rather than on the road, doing away

We would suggest that for a simple form of testing equipment, you sink into the floor two rollers of about the approximate size of ordinary automobile wheels, on which the rear wheels of the car rest, then place a strong hook in the wall directly back of the car and in line with the chassis, and to this connect a cable with a heavy spring balance attached, and fasten to the chassis to hold the car in place.

The two rollers mentioned will, of course, require that a pit be dug into the garage floor about 4x4x8 ft. An old rear axle will answer, the spring clips of which should be bolted firmly to concrete piers. Instead of wheels put drums in the position that they are even with the floor level at the top.

The brake mechanism should be connected to a lever so that varying degrees of load can be placed on the running car by the operator, and the brake connections should be equipped with equalizers. The lever will, of course, extend through the floor to the point in line with the brake equalizer, which is the "weight," and operating through the "fulcrum" secured to the floor in such a manner that the lever can be set in any position, as is the emergency brake of the car.

In order to determine the condition of a new car, or one that has been repaired, it is not necessary to calculate the horsepower as the pull on the spring scale is a good indication when considering the

It is best to test the car at definite speeds, such as 15 miles per hour in low gear, 20 or 25 miles per hour on intermediate, and 10, 30 and 45 or 50 miles per hour on high. When this test is made make a record of the draw-bar pulls so that the next car of same make and model may be compared, thereby making it easy to determine whether it is properly adjusted or not.

A spring balance that is capable of standing a 580-pound pull is sufficient for a car developing 110 horsepower at 70 miles per hour, so it stands to reason that a 600-lb. spring should be adequate for all requirements. It is advisable to make the drums exceptionally heavy, which will give enough flywheel effect to them to permit smooth running. Otherwise the reading may be difficult owing to extreme fluctuations on the spring balance.

* * *

Method of Distilling Water.

Question: I am operating a garage in which I am called upon to supply about 100 cars per month with distilled water for the batteries. I am not always able to procure distilled water at a particular time, and in sufficient quantities, and it has been suggested to me that I install a distilling apparatus in my garage. Will you please explain in the next issue of your paper just how this can be done?—B. C. N., Neb.

Answer: A still can very easily be installed in any garage at next to no cost.

The distilling apparatus consists of three receptacles, one for ordinary water, one for condensing steam, and one for holding the distilled water. The first receptacle should be about a two-gallon size, which is supported over the gas burner, and water poured through an opening in the top, which should then be closed. From this receptacle the steam thus produced should be carried over through a $\frac{1}{2}$ -inch copper pipe which is coiled through the second receptacle, previously filled with cooling water, thereby creating a condensation. From this coil the condensed water flows by gravity into the third receptacle, of about two-gallon capacity, which serves as a collector of the distilled water. About eight feet of the $\frac{1}{2}$ -inch copper pipe should be quite enough for the coil.

In case the distilled water receptacle is securely connected to the condenser tubing, there should be a vent made in the side of the receptacle near the top, and a faucet at the bottom, which will permit air to flow into the receptacle as the water is drawn off through the faucet.

It might be found convenient to connect a glass gauge which will show how much water there is in the receptacle. Otherwise a two-gallon glass bottle may be used for receiving the condensed water. It may be found advisable to use thin sheet copper, or tin or galvanized sheet iron for making this still, and for one, two or three gallon sizes each the receptacles should be approximately 5x10, 6 $\frac{1}{2}$ x13 or 8x16 inches.

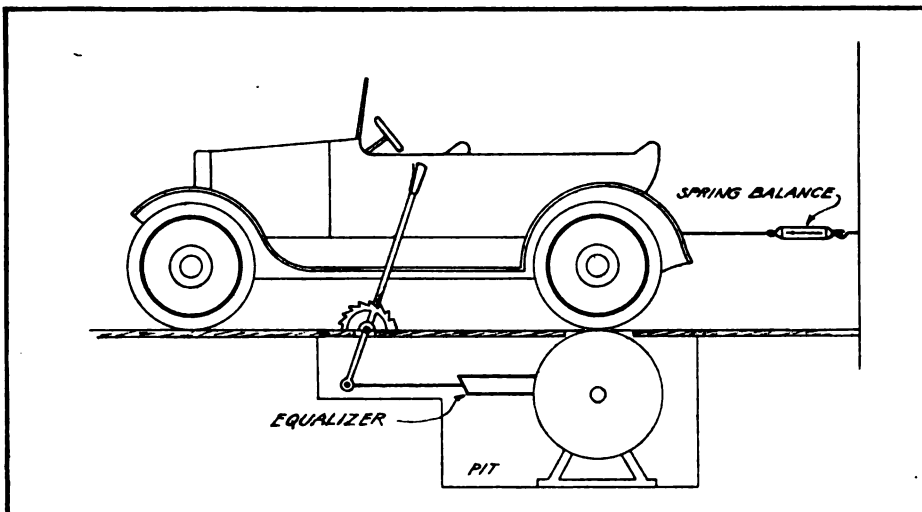


Illustration Showing Method of Erecting an Inside Testing Device for Cars by Fitting Drums on an Old Axle. The Load Is Produced by Means of a Braking Arrangement as Shown.

with any possible accident to the car, should save time, and enable the mechanic to watch more closely to the running of all the parts of a car. I would like to ask if you will kindly advise me whether or not there is an inexpensive arrangement that could be installed in my shop, and any suggestions along the line of shop testing which you might make?—J. M. Co., Ohio.

Answer: There is no doubt as to the correctness of your idea that there are many advantages to be gained by chassis testing in the shop over that on the road.

speed. As an example, if it is desired to have the best carburetor adjustment for 28 miles per hour, the motor would be operated at about this speed, when the testing brake should be applied until the speed does not increase even with the throttle open. The pull on the spring balance is then read in pounds. Continue to so adjust the carburetor until the greatest pull is found. There will be an increase in speed when the carburetor is so adjusted as to indicate improvement, which can be reduced to normal by applying the brake.



Complete Outfit \$7

Free Patches Enough to Pay for It

To quickly introduce this wonderful new Shaler Garage Vulcanizer—we will send *Absolutely Free*, with each outfit—an assorted supply of Shaler Patch-&-Heat Units, that will make repairs enough to more than pay for the outfit.

This new gang vulcanizer was designed especially to meet the demand from Garages and Repair Shops for a large capacity, quick action, dependable vulcanizer, that uses the convenient Shaler Patch-&-Heat Units. These handy units are very popular for making tube repairs. Over 10,000,000 punctures were repaired with them last year. No other method is so quick, safe, convenient and satisfactory.

Makes 4 Repairs in 5 Minutes

You can obtain garage size, Large Packages of Shaler Patch-&-Heat Units from your jobber, at prices so low as to make this the cheapest method of vulcanizing. There is no danger—no gasoline, no blaze, no flame, no trouble, no waiting to heat vulcanizer.

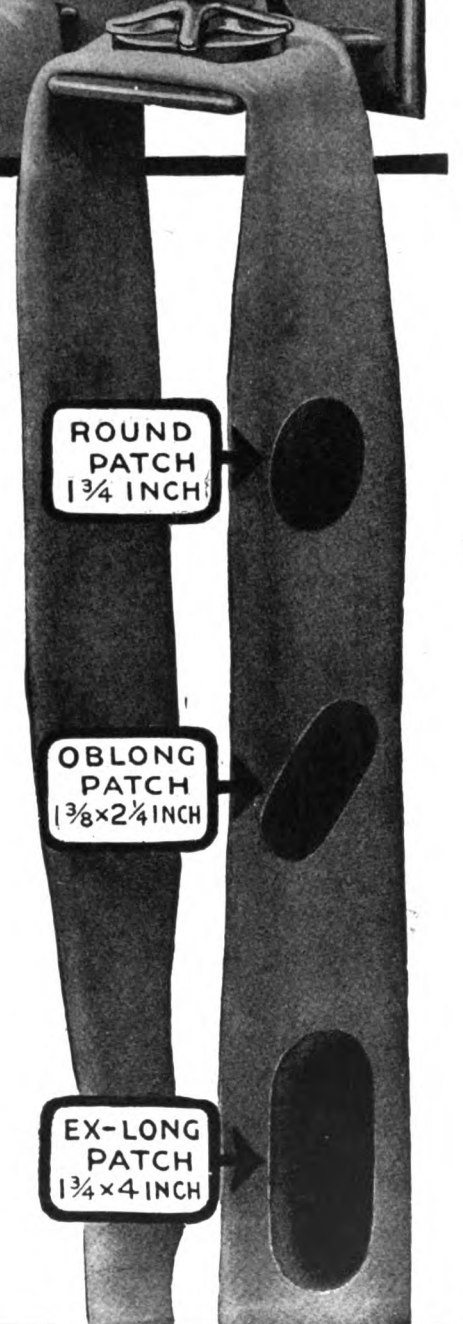
Prompt Shipment If You Order NOW

For months our factory was unable to keep up with the big demand for this wonderful vulcanizer. We have now enlarged our factory and increased its capacity—and can promise prompt shipment—provided you order at once.

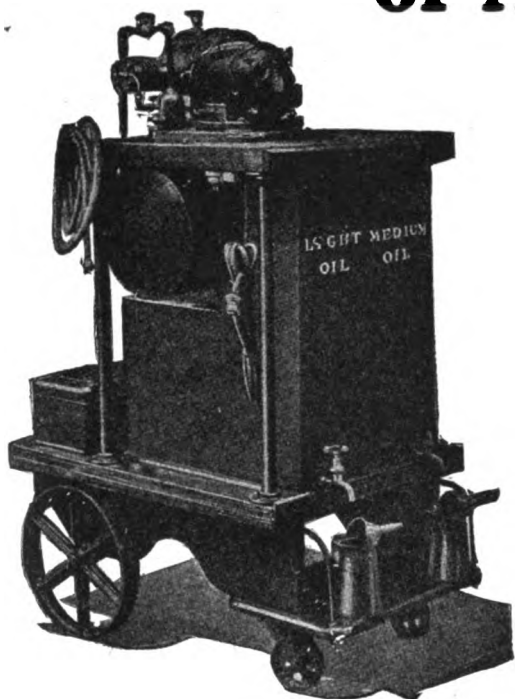
Write Quick—or Ask Your Jobber

Our low List Price \$10 is subject to 30% trade discount, making the Net Price to you only \$7—and with the outfit we will send you Free Patches enough to more than pay for it, so that the outfit costs you practically nothing.

C. A. Shaler Company, 367 Fourth Street, Waupun, Wis.



To Distributors of Automotive Equipment



This Utility Model gives a free air service and produces sufficient sales, not otherwise obtained—to pay you a profit of over \$400 in a year, thus turning what has heretofore been a liability into an asset. Ask for particulars.

**HOW
THIS MODEL
FORCES PROFITS
FROM THE
START**

OUR National Advertising has brought many inquiries from all parts of the country. A large part of these have been turned into sales.

But a far larger part could be so treated through the cooperation of exclusive distributor jobbers. We have created, therefore, a comprehensive exclusive distributor jobber sales policy that provides rapid turnover and satisfactory profits without the necessity of carrying a large stock.

Our line of compressors meets every need of automotive equipment. The goods are right and the sales policy controlling those goods is the basis of our success.

There are still some territories open to responsible distributors and jobbers. Our propositions will interest you.

Let's get together now!

Two Cylinder
GENERAL
AIR COMPRESSORS

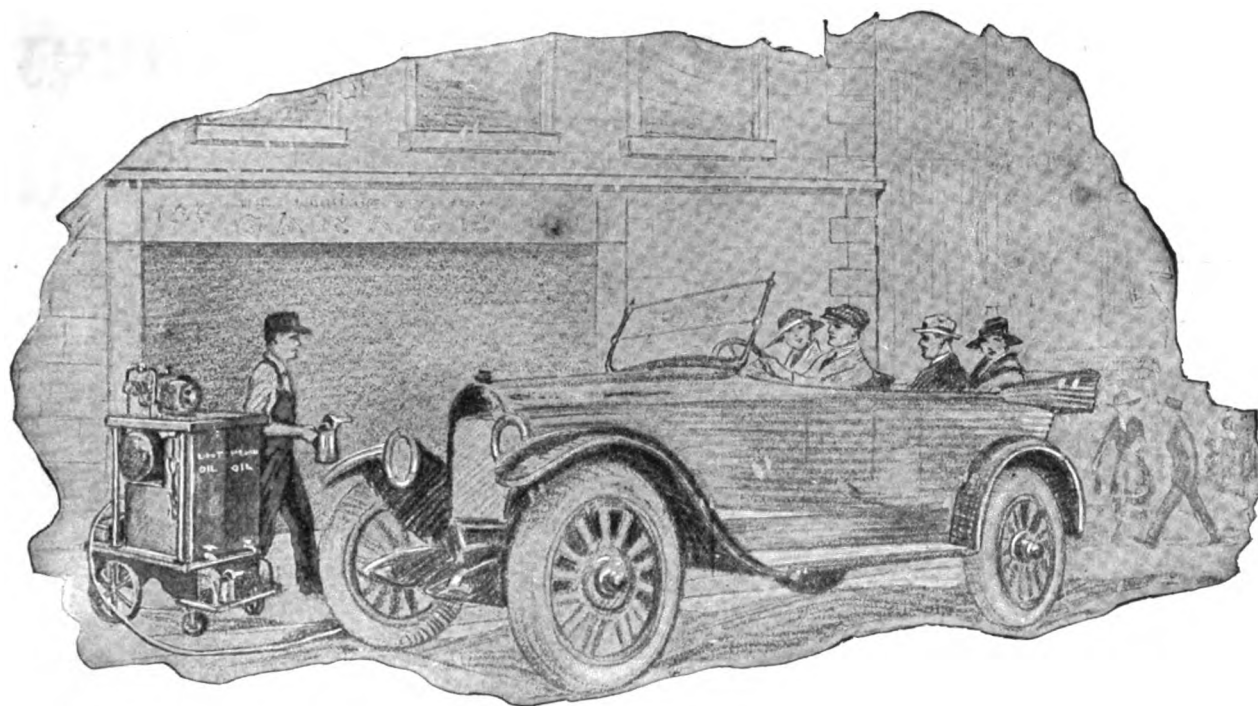
UTILITIES SALES

Sales Rep.
GENERAL UT

Factory 1324 Ogden St. Philadelphia - Office 8

Utilities that Sell

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



“Might as well put in a quart of oil”

is what a surprisingly large number of FREE AIR patrons say when served from the General Utility Air Compressor Combination.

That's the psychology behind this study we've given the FREE AIR business.

For most drivers appreciate FREE AIR at any garage—no matter how furnished. But when you *come out* to the curb to save the customer the *drive-in*, that's an added courtesy that forces a feeling of obligation. So that when the air comes from a General Utility Compressor, carrying oil as well—and the tank is so lettered—there's a powerful urge created to repay your courtesy with a purchase of oil.

For any motor can stand another quart.

This is why you can force oil sales by the FREE AIR route—if you use the Utility Model of General Air Compressors. You turn the liability—this FREE AIR service—into an asset—the sale of oil.

It's a gift—this air. But the Compressor suggests oil to the man who came to you for FREE AIR. And your sales mount.

There are eight models of General Utility Air Compressors—one for every need. We will send particulars, if you'll ask it.

CORPORATION

Representatives

TY COMPANY

New Stock Exchange Bldg., Philadelphia

because They Serve

Two Cylinder
GENERAL
AIR COMPRESSORS

Accessories — They Bring in Money

Here Are Presented Practical Ideas, Suggestions and Merchandising Plans, All Relating to Automotive Equipment Which Energetic Dealers Can Adapt to the Profitable Conduct of the Accessory Branches of Their Business

H-B Files and Cabinets Adapted for Office and Shop Use.

Every day the need of properly filing correspondence and stocking small parts and accessories becomes more evident in the light of increased efficiency, and consequently to be ready to meet this demand Hobart Brothers Co. has added to its list of products an assortment of letter files, small-parts bins, and cabinets.

The assortment of H-B files and cabinets can be adapted to a variety of uses in office or shop: catalogs, pamphlets, dealer helps, stationery, screws, brads, nails, nuts, automotive accessories, repair parts, and tools. Write for descriptive pamphlet and prices to Hobart Brothers Co., Troy, Ohio, mentioning American Garage & Auto Dealer.

The concern also manufactures motors from one to 15 horsepower capacity for emery grinders, presses, water pumps, lathes, etc. The service department will gladly advise dealers on their requirements. This service cost is free to dealers who write to Hobart Brothers Co., Troy, Ohio, mentioning American Garage & Auto Dealer.

Advance Accessories Concern Has New Dealer Helps.

The Advance Automobile Accessories Corporation, maker of White Stripe and Advance Cork Insert linings, have just brought out three new and attractive dealer helps. The card shown in the illustration is for Advance Cork Insert. It is 9x12 in size, effectively lithographed in red and black. The hand holds an actual piece of Advance Cork Insert lining. This display is unusually effective, for it not only attracts the eye but also gives to the prospective purchaser an accurate idea of what

this lining looks like. The card is made so as to hang from a nail—or to be stood on counters.

An equally effective card is out for White Stripe lining. The carton and lin-



Display Card That Will Help Dealers to Sell Cork Insert Lining.

ing are well displayed. The White Stripe card is printed in three colors, and is immensely popular with dealers. A new window display is the third item. It is a gigantic carton of Advance Cork Insert lining, four feet high and three feet wide, lithographed in three colors, showing the lining and corks in natural tints. This large display is mounted on very heavy stock and has substantial easel. Any of these cards are supplied to dealers, free of charge, who write to the Advance Automobile Accessories Corporation, 56 E. Randolph street, Chicago, and mention the American Garage & Auto Dealer.

Tire Patch Salesman Visits Customers by Airplane.

What is described as the first airplane to be used for commercial purposes is carrying Sales Manager Edward (Airplane) Irvine of the Locktite Patch Co.,

Detroit, around visiting his concern's customers. The pilot is Phil Wood, brother of President George Wood of the Locktite concern. He entered the government aviation service about a year ago and qualified as an aviator at Chanute Field, Illinois, in the minimum length of time.

"Perhaps it's because I'm left-handed that I had no difficulty in learning to become an aviator," said Wood. "You know you drive an airplane left-handed, and naturally, I had an advantage over the right-handed cadets."

"While it won't be possible to stop at very many small cities, call upon the accessory dealers and sell them Locktite Patchers, we will distribute folders and other literature as we fly over all towns," said Irvine.

"We figure that with the airplane we will cover as much territory as 10 or 12 salesmen traveling on trains. As far as we know our airplane is the first to be used exclusively for commercial purposes—and we have conclusively demonstrated that it is a big success."

A Practical Tire Tool for All Rims of the Split Type.

The Trexler Co. has on the market a tire tool which it claims is very practicable and efficient, self-adjustable and very simple in manipulation. Only three operations are necessary in order to change a tire: unlock the rim with the Trex tool, compress the rim to remove it, and expand the rim into the tire and lock it.

"Trex" is made to fit every kind and size of split rim. The Trexler officials claim that it does not injure the rim or spring it out of shape, and eliminates all danger of pinching the inner tube. It is made of malleable iron and is said to be light, strong, and durable.

One of the features of the "Trex" tool is that it will remove rims that have become rusted to casings without pulling away portions of the beading. This is one of the reasons why the tool has become so popular with mechanics whose work includes removing tires from rims at repair shops and service stations.

Dealers are invited to write to the Trexler Co., 1418 Walnut st., Philadelphia, Pa., for trade prices and full particulars, mentioning the American Garage & Auto Dealer.



Airplane Used as Conveyance by Sales Manager Edward Irvine of Locktite Patch Firm—In Oval, left, Phil Wood, Pilot, and Mr. Irvine.

*more
money for
garages*

Do you want to be able to make quick, accurate tests to locate any defect in the electrical system? Or do you want to consume unlimited time taking apart every device and running a chance that you will discover the trouble sooner or later?

There are scores of places where trouble may occur. Unless you test electrically, you cannot eliminate any possible source of trouble without taking each device apart.

A poorly made, inaccurate electrical instrument merely adds to the uncertainty. What you need is reliable, positive knowledge. This Model 280 really is the equivalent of six separate Measuring Instruments of different ranges. It is extremely accurate, durable and serviceable. With it, you can do the work quickly and intelligently, putting yourself a long way ahead of any competitor who has not Weston Equipment.



How often are you called on to locate and correct trouble in Electrical Starting and Lighting Equipment? You are bound to have more and more of such calls, especially if you earn a reputation for knowing the electrical side of an automobile and handling it right.

There is big money in Electrical Installations, Repairs, Adjustments, Renewals, etc. Some of the most wide-awake Garage Men have found it out. This year more money than ever before will be made that way, because there will be more electrical work than ever for the man who knows how.

Guesswork won't do. Every time you guess wrong you are likely to make yourself a peck of trouble and lose a customer in the bargain. What you need, and need right now, before you find yourself losing opportunities to make money, is a

Weston
Model 280

Garage Testing Instrument

This complete Electrical Testing Equipment is made by the world's foremost Electrical Instrument designers and makers. It meets every requirement for making electrical tests in the garage. With this WESTON MODEL 280 you can handle anything that comes your way in electrical work. And it doesn't cost a small fortune, either—mighty little for what it will help you to make.

With the Instrument, we furnish full information showing you how to use it. And we have a staff of electrical experts whose advice is yours for the asking any time you think you need it.

**Prompt Shipments
from stock—**

Order at once

WESTON ELECTRICAL INSTRUMENT CO.
30 Weston Avenue, Newark, N. J.

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| New York | Detroit | Pittsburgh | Miami, Fla. | Winnipeg |
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| Cleveland | Cincinnati | New Orleans | Halifax | Mexico City |

Favors Commission to Build Roads

Former President of American Automobile Association and Member of Special Committee of Good Roads Board Declares that the Task of Directing Construction of National Highways is Too Much for Departmental Bureau

By Dr. H. M. Rowe

That a commission, as contemplated by the Townsend-Bankhead bill will be the method of administration adopted by Congress for building a national highway system is indicated not only by public sentiment but by the weight of government precedent.

Highways should be considered in the same class of public activity as railways, waterways, merchant marine, the national banking system, and, in fact, any of the great distinctly national undertakings. It seems a self-evident proposition that the building of a national system of highways will form an enterprise of such magnitude and such complexity as to put it entirely beyond the sphere of a single bureau or other subdivision of an executive department and if, therefore, it be considered in the class of these greater national enterprises I have named, we should naturally expect to see the same kind of administrative machinery established for highways.

By way of precedent, therefore, we may point out that the railroads while under government control are managed by a director-general who is not subject to the control of any cabinet officer and that in the absence of government operation of railroads the Interstate Commerce Commission functions independently of executive departments.

When we turn to the great shipbuilding and merchant marine industry, we find these are managed by the Shipping Board and the Emergency Fleet Corporation, both functioning apart from executive departments. If we turn to the national banking system, we find the Federal Reserve Board instead of a bureau of the Treasury Department. Other examples might be cited. Bureaus of executive departments are principally engaged in investigative and educational work and in the routine performance of a government activity more or less inherently and continuously a part of the executive machinery.

There is no existing executive department which could legitimately take over the entire task of building a national highway system. It might be contended that the Department of Agriculture should do the job because of the agricultural interests affected by highways, but immediately the counter-contention might be made that the War Department should build the system because of the military and national defense needs of the nation. The Post-office Department might very logically claim that its rural delivery and parcel post service should entitle it to control.

The Department of the Interior being

almost entirely a public works department might contend that a constructive engineering task should fall in its domain.

As an outcome of these various contentions must come the realization that highways are of such an all-embracing and of such general importance as to make it impracticable to entrust the task as a minor undertaking to any single government department. A commission, however, would consider the needs of all the departments.

From the standpoint of directness, of responsibility, timeliness of action and comprehensiveness of knowledge, a commission devoting its whole time to the one single task could not fail to accomplish far greater results than would be possible through the medium of a cabinet officer who would be devoting the greater part of his time and attention to matters wholly foreign to highways. It would seem that the commission plan is unassailable.

Penlings from the Pen of Dike

(Not Copyrighted.)

July First the Country Went Dry. Now, Mr. Garage Man, is the time to stock Water Bags.

Make the Tourist Feel at Home in your Garage just the same as if you had him at your own Home sitting at the Dinner Table.

If the outside of your Garage looks dingy Paint up and you will find that the Business Barometer will be going up.

Don't worry the Customer about War Tax, He Has enough Trouble, just put it in the price and you will save time, trouble, politics and temper.

Free Ice Water for the Tourist and Customer will be remembered long after the Snow Flies.

Fly Time is here and screens around a Garage keeps out the Flies and the mechanics can work better when they don't have to fight flies.

Let's Go seems to be a Big Slogan Right Now. I say Let's Go and Get the Cash.

Every time you see a Big Advertisement in a Magazine of something you sell just mark it down that them folks what put it in are working for you and it's another Salesman only you don't have to pay its Salary.

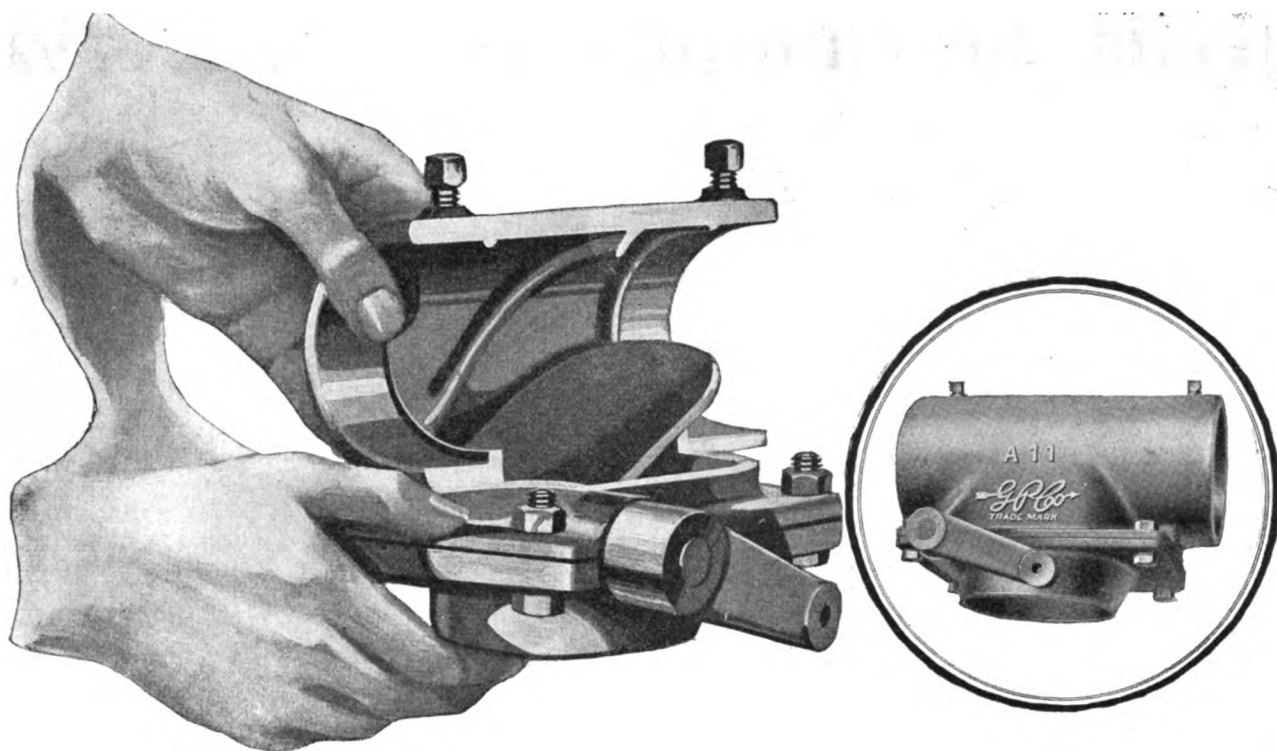
The Victory Loan went over the Top. Why, because it was pushed and Advertised. Well, Advertise your own Business and watch it Go Over the Top.

Fourth of July has come and gone. Now let's all celebrate by declaring that we won't sell anything but Standard Merchandise at Standard Prices.

Hot Weather brings Tire Troubles; test your Customers' Tires often and by doing that you won't have them Cussin' and Sweatin' out on the Road.

Advertise to beat the Band this Summer for the Golden Harvest is here right now and the one that tells them He wants their Business is the one that Reaps the benefit.

C. H. WOODEN (Dike).



Is your motor cheating?

Do you know your motor's secrets?

CAN you tell when you are wasting power? How do you know all your cylinders are doing their full work? You may be wasting power and not know it—that means wasting gas and money.

There is only one efficient way to tell just how healthy your motor is. Put a G-Piel Muffler Cut-Out on your car.

The G-Piel Muffler Cut-Out will tell your motor's secrets. It is designed so that the carbon deposits cannot form and cause it to leak. Gases exhaust fully with no possibility of back pressure.

Sales Department

EDWARD A. CASSIDY CO., Inc.
Madison Ave. at 40th St., New York City
Manufacturers: THE G. PIEL CO., Inc.

The G-Piel Muffler Cut-Out

PIEL PRODUCT

"Tells the motor's secrets"

Needs of Compressed Air Service

Development of Air Compressors from the "Air Pumps" and Make-shift Machines Which Caused Much Prejudice in the Early Days of the Industry—Essentials of Present Time Air-Service Requirements

By A. B. Jenkins

Cincinnati District Manager, Brunner Mfg. Co.

In the early days of the industry it was a mooted question whether air compressors were ever to be endured in garages, tire shops and service stations. When we look back even a few years and see some of the monstrosities that were in use under the dignified name of air compressors we are not surprised that it required a long course of education to bring owners and proprietors of service stations to realize the fact that air service is not a luxury, but a necessity of first importance.

Compressor manufacturers as a class were responsible in no small measure for the slow growth of the use of compressed air in automobile service stations. Instead of studying the situation and developing a line of compressors to meet those conditions, many makers offered compressors of conventional type that had been designed when the "horseless carriage" existed nowhere but in the imaginations of mechanical "cranks."

These "air pumps" were in most cases big, awkwardly constructed, slow running, belt-driven machines, which an occasional user would mount with a second-hand motor as a close-belted, motor-driven unit. Misapplication naturally resulted in unsatisfactory service and it required a long season of educational effort to convince the motor car fraternity that there really is a difference between the "air pump" of the early days and the refined, automatically controlled, motor-driven air compressor of today.

Every branch of the motor car industry is selling "service." That service is most essential which tends to prolong the life of that item which represents the largest percentage of the cost of car maintenance, tires. The tire men are constantly driving home the fact that tires suffer far more from under-inflation than from over-inflation. Most motorists have proved this themselves and this has done much to transfer air service from the position of a luxury to that of an absolute necessity without which no service station of whatever kind is complete.

These motorists who are demanding air service are demanding efficient air service. A service station is advertised just as effectively by a dependable air system as is a restaurant by good coffee. It is the invariable rule that the garage superintendent or service manager who is negligent in regard to his air service is correspondingly so in other shop equipment.

Time was when there may have been some reasonable excuse for the existence of a service station without an air compressor. There was little to offer encouragement to manufacturers to develop compressors especially adapted to the service and little uniformity of opinion as to what kind of conditions would have to be met.



Development and Necessity of Adequate Air Service Explained by A. B. Jenkins.

The automotive industry is now as permanent as the clothing industry and, thanks to the co-operation of the engineering departments of the several branches of the industry, there exists a very clear understanding of what is good practice in garage and service station equipment. No one size and type will meet all conditions. Attempting this is what caused much of the dissatisfaction in the early days.

As the first move toward providing air service, careful note should be made of all possible uses to which air may be applied where the compressor is to be installed. The old idea that its use is limited to the inflation of tires is absurd. It can be dispelled by spending an hour in any up-to-date garage or service station.

Air is ideal for blowing dust out of tufted car upholstery; used with a kerosene spray it provides a most efficient means of engine cleaning. With a small nozzle to concentrate the jet, carbon residue is readily removed from cylinders after burning out; mixed with gas by means of

a compound blow-pipe, it produces an exceedingly hot point of flame for brazing or soldering. By subjecting a radiator to even low air pressure, leaks are discovered that it would be next to impossible to detect with water; top and body dressings are applied by pneumatic atomizers. In paint shops the first or body coats can be applied in no way as rapidly and at the same time as effectively as by the air-brush method.

The foregoing are but a few of the many possible uses for air aside from the original one of inflating tires. It is a matter of prime importance that the compressor be of ample capacity. Get one large enough. It is an evidence of lack of that self-confidence that is essential to business success, to fail to provide for growth in any business. Equipment is not bought for today but for next year and the next year and the year following that.

Manufacturers of small compressors who have specialized in compressors for the automotive industry and have applied modern methods in doing so, are in possession of data enabling them to make reliable recommendations as to the sizes and types of compressors best adapted to any given conditions.

The matter of lubrication is an important one. It seems to be the opinion of some users that "oil is oil" and many compressor complaints are directly traceable to the use of improper lubricants. The lubricating conditions found in compressor work very closely parallel those of gas-engine practice. Consequently, any high flash point oil that is successful in a gasoline motor is suitable for a compressor.

The success of an air outfit depends largely upon the care exercised in installing, to prevent leaks in the system of which it is a part. An air leak represents a loss just as certainly as a gas leak, and should be stopped just as promptly. Particular attention should be given to the matter of valves and fittings to make certain that they are fitted for air. Pipe should be carefully threaded and the male threads well coated with lead and oil or litharge and glycerine before being screwed together.

A fitting closing thought is that of safety first. To save a paltry sum by purchasing a discarded or even a new range boiler for an air storage tank should be a criminal offense as endangering the public safety. Select a genuine air storage tank



No matter where you are located there is a Harvey Jobber near you who can supply you on a moment's notice with a genuine Harvey Spring for any make or model of Automobile.

Write today for the free Harvey Spring Book, giving specifications for more than 900 kinds of Harvey Springs and other valuable information. Ask us the name of the nearest Harvey jobber.

Harvey Spring and Forging Company

1048 17th Street, Racine, Wisconsin

from a reputable concern and get one tested to twice the working pressure that you find it necessary to carry. Then be sane in the matter of pressures. A pressure of 115 pounds is ample for the largest tires used on passenger cars, hence a pressure of 140 pounds or 150 pounds in the tank is ample for passenger car service.

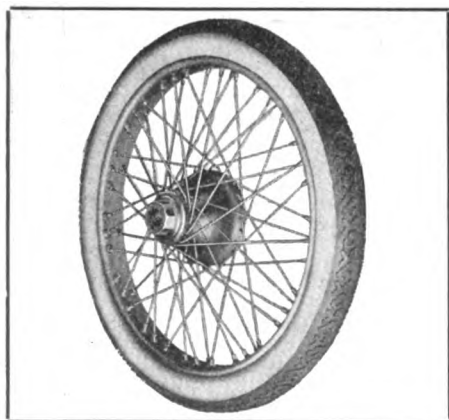
For truck service stations which may eventually be called upon to serve 10-inch or 12-inch heavy-duty pneumatic truck tires carrying a maximum of 145 pounds in the tires, the use of extra-heavy tanks is advisable with pressures ranging from 150 pounds to 175 pounds per square inch.

Quantity Production of Stewart Wire Wheels Is Started.

The Stewart Wire Wheel Corporation of Frankfort, Ind., announces the beginning of quantity production of Stewart wheels for passenger cars. At present only the department making Ford wheels is in normal production, but plans are being made to produce a complete line for every make of passenger car. R. A. Tyree of Frankfort, Ind., is general manager of the company.

The engineers of the company have developed an improved construction for wire wheels. The "reverse taper" construction, used to insure safety in applying propellers on airplanes and in securing the breech-block in heavy artillery, is employed in the new Stewart wire wheel.

In the new Stewart wheels, all danger of wheels accidentally coming off is said to be eliminated. The inner hub and outer hub each have four reverse tapers. As the outer hub is applied, the tapers slip into grooves, and a one-eighth turn locks the reverse tapers of the outer hub to those of the inner. Each taper has bearing on the entire surface of the other. Even when the tapers begin to wear down, perfect bearing surface is maintained until



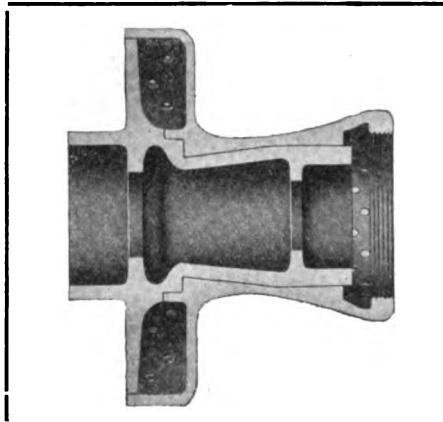
Stewart Wire Wheel.

both reverse tapers are entirely worn away.

Until the reverse tapers are automatically locked in correct position, the hub cap cannot be applied. Inside this hub cap is swiveled a wedge key with four tapered wedges. This wedge key has two func-

tions. It carries the wedges for securing the wheel upon its taper bearings. At the same time, the end of the inner hub projects into the wedge key, which in turn reposes in the recess in the hub shell, thus providing a positive, direct drive combined with rigidity of wedge bearings.

When the correct contact of the reverse tapers is secured by the one-eighth turn of the outer hub, recesses opposite each other in the two parts of the hub create definite slots into which the tapered wedges of the wedge key are seated. Unless the two parts of the hub are in exactly the right position, these wedges cannot enter the slots provided for them. Turning the hub cap forces the wedges home, and they are held in place by an automatic spring lock ratchet mechanism.



Cross Section of Hub, Showing How Reverse Tapers Are Locked.

Two or three final turns with a hub wrench make the hub cap absolutely tight, and the spring lock prevents its working loose.

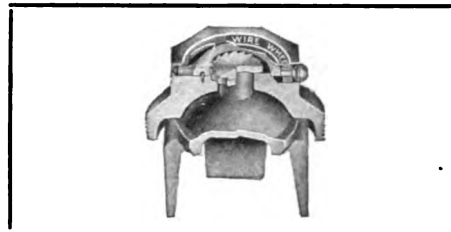
Ford Electric Starters to Make Work for Battery Chargers.

With the announcement that all new Ford cars will be equipped with electric starters comes a new opportunity to garagemen and automotive supply dealers. They should begin considering the profits and advantages which this field offers.

This new demand for charging service will overtax the present battery stations and the owners of cars will look to automotive dealers and garagemen for this service. If they are prepared to meet this demand it will mean a profitable business besides increased sales of electrical accessories, and an opportunity to build up repair departments. It is well worth considering the installation of a battery charging outfit.

Hobart Brothers Co. has recently put on the market three different battery chargers: a 32 battery capacity charger, a seven battery charger—the above two are direct connected—and a belted battery charger. The manufacturers claim that no special electrical or mechanical knowledge is necessary in order to operate them.

They are said to be practically trouble proof, any one can handle them by following instructions, and that the large com-



Hub Cap, Showing Four Tapered Wedges That Fit Into Slots.

mutating surface and low operating speed insure dependability.

Circulars giving descriptions and trade prices can be obtained by writing to Hobart Brothers Co., Troy, Ohio, and mentioning American Garage & Auto Dealer.

Has a Very Novel Vacation Car for Hunting Trip.

(Continued from page 31)

gasolene stove fuel supply. An auxiliary hand pump system is supplied for emergencies.

Underneath the car are located a 30-gallon gasolene tank for the engine, a seven-gallon gasolene tank for the stove, and a 30-gallon tank for the drinking water system. The gasolene tank supply for the engine is taken care of by a vacuum feed system, not pressure. The ignition system of the car is entirely independent of all other electric wiring connections. A view of the instrument board and general interior of the car is shown in Fig. 3, taken through the rear door.

Nothing has been left out of the equipment of the car which would provide for the comfort and convenience of the owner and his guests. The car is being used now by Mr. Steedman and his family in touring Arizona and the southwest.

Tentative Chart of Accounts Set Up.

(Continued from page 21)

janitor service, taxes and miscellaneous items. A complete analysis of these expense accounts will be furnished in the next article. These lists are purposely incomplete. Let us have your suggested additions to them.

Other Income, Other Deductions.

These subdivisions will be discussed in detail in the next article. We know this chart will not agree with the chart of accounts you are using at present, and if you can offer any criticisms, additions, or suggestions, write us. We will have a lengthy article next month when we go over the chart account by account.

PASCO

Riding Comfort

Is far greater in a car equipped with PASCO WIRE WHEELS.

You get the full benefit of the elasticity yielded by each wire spoke.

This "springiness" eases the strain on the car-body. Jars and bumps lose most of their terrors.

Chassis repairs diminish. You obtain much higher mileage on tires and gas.

You enjoy more security, since a PASCO Wheel is at least 5 times stronger than a wood wheel, size for size.

Besides—you have the PASCO ingenious spoke-lacing, safety locking device, indestructible hub-cap, complete curb clearance, and many other PASCO advantages.

Perhaps you begin to see why PASCO WIRE WHEELS are so strongly favored by car-owners and manufacturers who KNOW.

DEALERS: Write for our plan.

NATIONAL WIRE WHEEL WORKS, Inc.

GENERAL SALES OFFICES, DEPT. G
416-417 Book Bldg., DETROIT, MICH.

FACTORIES AT
Geneva, N. Y.
Hagerstown, Md.

Branches in
New York Chicago Detroit
Minneapolis Kansas City
San Francisco Seattle
Dallas Atlanta
IN CANADA: Northern Electric
Co., Ltd., Montreal

News of Manufacturers and Jobbers

Wayne Tank Company Starts an Advisory Service.

The Wayne Oil Tank and Pump Co., Fort Wayne, Indiana, recently inaugurated a new consulting and advisory service for oil men. F. A. Bean, consulting engineer, has taken charge of this work. He has had a broad engineering experience covering a period of 23 years, 15 of which have been in an executive capacity.

Mr. Bean first became affiliated with the oil industry in 1902 in the Kentucky and Oklahoma fields. For the past year and a half he has been at the head of the maintenance and equipment department of the Sinclair Refining Company, and also had charge of the designing and construction of their sales branches and filling stations. He has also been closely associated with the automobile industry and his knowledge along these lines should be of great assistance to oil men in the purchase, operation and maintenance of their rolling equipment.

There is to be no charge connected with the service of this department. All advice, plans, etc., are to be given gratis. This service should appeal to all oil men, especially the marketers and jobbers. The Wayne Company invites all oil men to make free use of this service.

Ohio Truck Distributor Joins Grant Sales Organization.

Birkett L. Williams, truck sales manager of the Grant Motor Car Corporation, announces the appointment of Homer L. Schneider as a member of the Grant truck sales organization, covering western terri-

and for the past four years has been general manager of the Republic Motor Sales Company of Cleveland.

Prior to entering the motor truck field, Mr. Schneider was for several years connected with the Van Dorn Electric Company and was instrumental in introducing to the trade the electric drill.

Special Machine Tempers and Shapes New Era Springs.

The making of springs is one of the exact sciences and requires close supervision at all times. For instance, the very best steel stock procurable, may be spoiled before it becomes a spring, at one of a dozen places in manufacture.

New Era "better" springs are heated in an oven, whose temperature is maintained at exactly the right degree by an electric pyrometer. When the steel shows the right color to the expert oven operator, the spring leaves are withdrawn and laid in a machine (exclusively a piece of New Era mechanism), and shaped and tempered at the same time, in such a manner that every fraction of every inch of the surface gets the same temperature, and will touch in a close fit over its whole length, with its sister leaf in the spring, when complete.

It is customary for spring makers to bend the springs into shape, section by section, until the leaves approximately take on the shape required, but because the New Era spring is forced into shape, much as a half a lemon conforms to the shape of a lemon squeezer, the New Era spring is shaped correctly, and tempered uniformly.

The shaping and tempering machine consists of an endless chain, interspersed at equal distances with spring leaf shapers, which move progressively from the top of a 1,500 gallon oil tank, down to and across the bottom, and up the other side. Each spring-former starts with a white hot spring leaf and continues through 1,500 gallons of tempered oil, gradually cooling the leaf, giving its temper as well as its shape. When the leaf rises to the top of the fluid, it is uniformly shaped and uniformly tempered. The oil in the tempering tank is maintained at a uniform temperature, no matter how many springs are immersed, by a water circulating device, whereby cold water comes in contact with the exterior of the oil tank, keeping it cool.

A single machine in the New Era Spring & Specialty Co.'s plant has a capacity of tempering and shaping 240,000 complete springs every year. After New Era "better" springs are removed from this shaping and tempering device, they are annealed in an annealing furnace to further

assure that the springs are properly tempered and will be tough as well as hard. In this annealing furnace, close watch is kept over the process and again the electric pyrometer plays its important part in making "better" springs.

Shape, temper, and toughness are the qualities that determine a spring's life, resilience, and value. The New Era shaping and tempering machine enables the manufacturer to produce quality springs in a quantity that in turn makes possible a low production cost and corresponding low price to the consumer.

"Highest Priced" Motor Oil Makes Appearance on the Market.

What is described by its producers as "the highest priced lubricating oil" has just made its appearance on the market. The name under which this new merchan-



Type of Can in Which "Highest Priced" Oil Is Marketed.

dise is advertised and marketed is "88" motor oil and it is declared to do more to protect motors from overheating, from friction and from gummy carbon deposits than any other precaution that motor vehicle owners can take.

It is claimed that "88" motor oil is the finest lubricant that can be bought. It is said to be a pure, clean oil that contains no sediment or residue to break down under heat to form deposits in cylinders, on valves or sparkplugs. In addition to its confessedly "most expensive" oil, the Motor Oils concern is also marketing "88" cup grease and "88" gear grease. Trade prices and full information about these new lubricants may be obtained by dealers who address Motor Oils, Inc., 56 E. Randolph street, Chicago, mentioning the American Garage & Auto Dealer.



New Grant Truck Missionary, H. L. Schneider, Is Trade Veteran.

tory. Mr. Schneider is one of the best known truck distributors in northern Ohio,



6800 PEOPLE

Make nothing but National Cash Registers

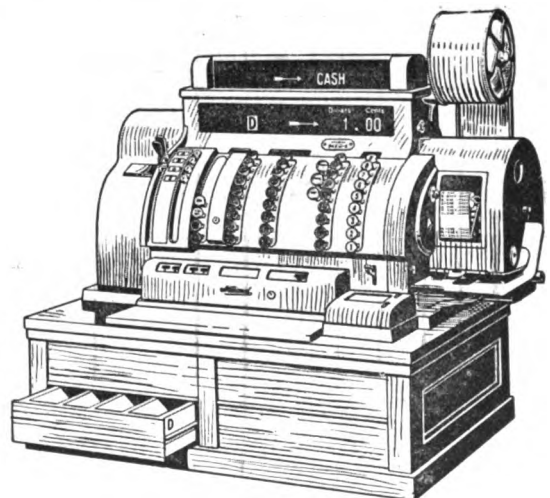
THEY work with the best materials that we can buy.
They are well organized. They are carefully trained.
Their working conditions are good.

They are making a machine that is the result of 35 years
of study. Into this machine we have put thousands of
suggestions from merchants all over the world.

These 6,800 workmen are doing their work so well that
we are making and selling more than 325 registers a day.

The National Cash Register Company
Dayton, Ohio

Offices in all the principal cities of the world



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Jenkins Company Keeps Reserve Stock of 100,000 Springs.

On the average, spring breakage on motor cars and trucks in the United States is said to amount to a spring per car per year. The annual output of springs for replacement purposes totals six millions. While many cars see a year or more of service without the breakage of a spring, this ratio holds good. In view of this condition, many motor car dealers, accessory dealers, garage men and blacksmiths are giving attention to the possibilities of the spring replacement business. The post-war revival of touring will doubtless increase this business.

The illustrations show the Boston and Minneapolis branches of the Jenkins Vulcan Spring Co. of Richmond, Indiana. An idea of the convenient arrangement of fittings for the storage and handling of a large stock of springs can be obtained from these illustrations.

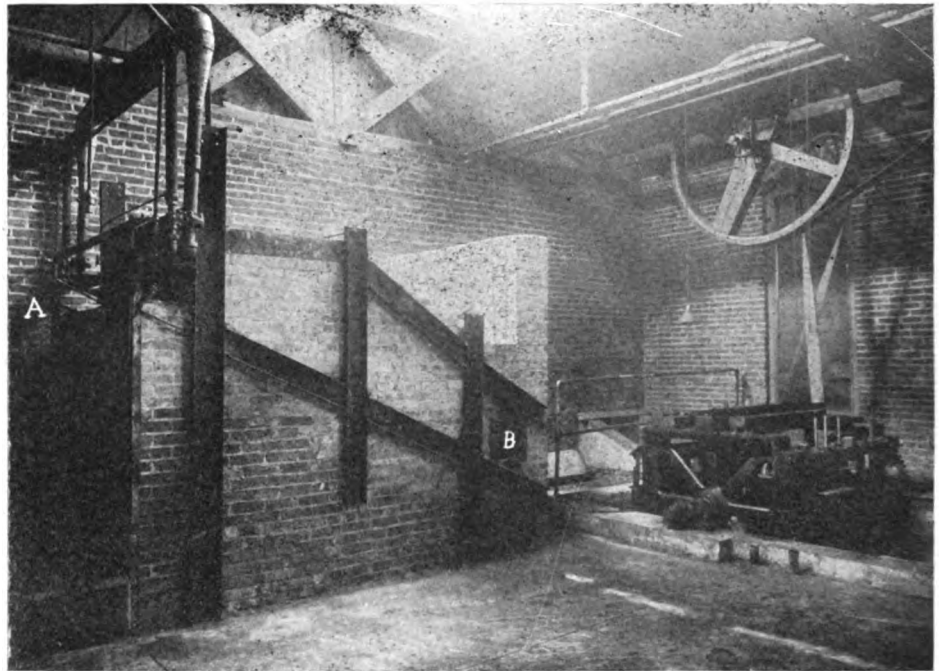
Every dealer entering this field is faced by the question of how many springs should be carried and for what cars they should be designed. The Jenkins Co. has worked out this problem on the basis of information covering the entire country. It advises the dealer to carry in stock about one-tenth as many springs as there are cars within a radius of 25 miles. A minimum stock of 100 springs should always be on the racks. These springs should be selected for the cars most numerous in the dealer's territory.

By way of supplementing the dealer's stock, the Jenkins reserve of 100,000 springs

may be drawn from at any time through the ingenious system of "automatic ordering." All the necessary routine is taken care of for the dealer at the Jenkins factory. The dealer has simply to fill out

Co., bearing on the reverse side the number of that particular spring and a statement to the effect that the dealer has sold it.

On selling the spring, the dealer signs



New Furnace Used by the Jenkins Vulcan Spring Co. The Plates Are Fed In at "A" by the Operator and Removed Through the Small Opening "B." The Heat Passes Overhead and Thus Makes It More Comfortable for the Workman.

a post-card with his name and address. One of these cards is illustrated herewith. Every spring sold carries an envelope containing a card addressed to the Jenkins

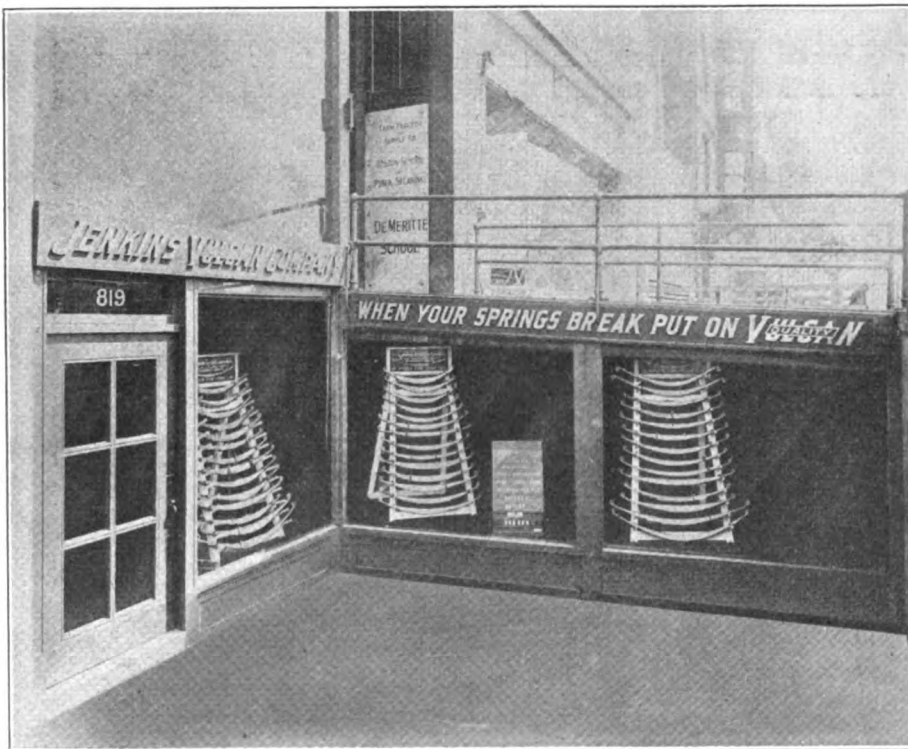
and mails this card. At the factory they are carefully filed and when "automatic orders" have accumulated from one dealer sufficient to make up a shipment of 100 pounds, the springs are shipped. This method saves the expense connected with shipping a single spring, which requires the same freight charge as 100 pounds.

Every dealer who enters the spring replacement field, with Vulcan springs, receives, with his first order a very attractive and substantial display rack to hold fifteen springs.

Some idea of the scope of the Jenkins business and the variety of patterns and designs needed to produce this extensive stock, may be had from the statement that the concern supplies at the present time, replacement springs for approximately 90 per cent of the automobiles now used on the market, and for models of the last four or five years.

In the manufacture of these springs, an original spring from each model of car is used as a pattern, which is followed to the letter in shape, length, width, number of leaves, placing of clips, size of hanger, bolt holes, etc. The only deviation from the original is in the quality of the steel and the method of manufacture. The steel used in Jenkins springs is of the highest quality, especially heat-treated and tempered by a special oil process.

For example, the photographs show the new bending machine for forming the



Windows of the Jenkins Vulcan Spring Company's New England Branch, Showing the Manner in Which Manager Frank S. Corlew Has Arranged Three of the Familiar Vulcan Easels, Each Holding Its Regular Allotment of the Jenkins Springs.

Performance vs. ?

In selecting a Compressor, what interests you most? Prices? No! Promises? No! Technical details? No! In the end, it is the cost of giving air service. You must have confidence in the concern that sells the outfit, confidence in the manufacture, and confidence in the future performance of the outfit.

Brunner Air Compressors have come to the front in the minds of the progressive garage men of the country. Brunner equipment has won and is holding national leadership as the undisputed standard.

No sales argument, no frenzy of advertising, no freak fixtures could win and hold that dominance. Brunner equipment has construction care that spells Performance. And, Performance merits leadership.

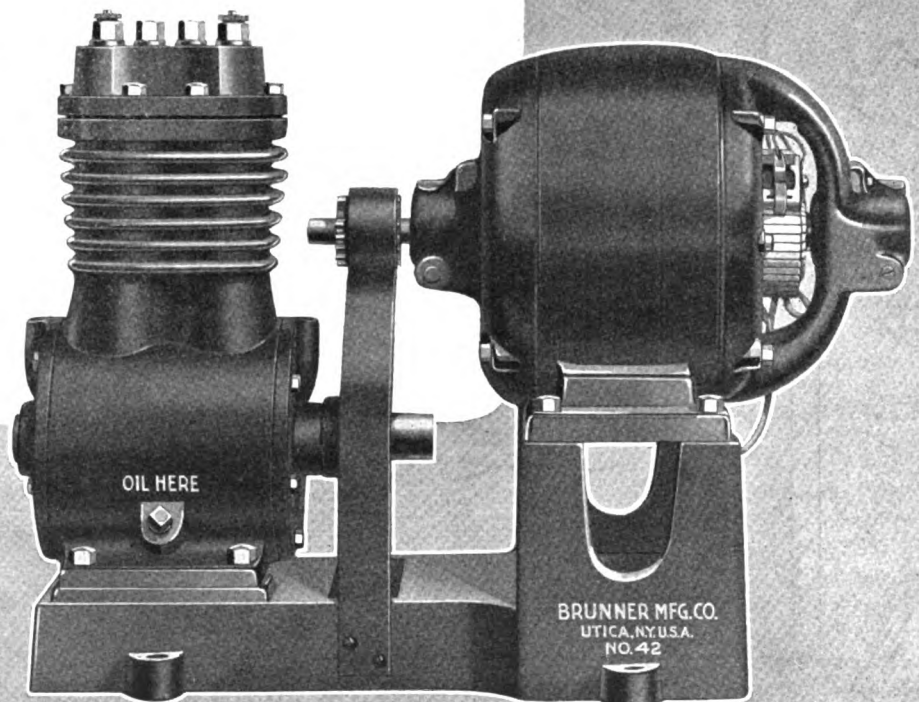
Brunner engineers use the laws of pneumatics ---they know the intricacies, complex problems and possibilities---after years of study and putting these laws into practice their resultant products give consistent economical Performance.

Write for illustrated folder,
displaying all types
and sizes.

BRUNNER MFG. CO.

Works
UTICA, NEW YORK
Sales Offices
UTICA, N. Y.
CINCINNATI, O.

BRUNNER



leaves of springs which the company designed and built for its own use. The machine is very simple and capable of forming 7200 plates a day. It runs at 3 r. p. m. As soon as the leaves are formed, they are immersed in an oil bath, and an endless conveyor carries the plates to the end of the oil tank, where they are deposited.

One of the new types of furnaces which this company has evolved also is shown herewith. The feature of this furnace is that the workmen are not exposed to the tremendous heat and glare of the red hot bricks and metal.

The plates are fed in at the point A and come out at point B, from which point the workman lifts the plates to the bending machine. Very little heat comes throughout the opening B, with the result that fatigue is greatly lessened among the men. Nearly all the heat passes overhead.

The Jenkins Vulcan Spring Co. now has under way plans for the erection of a modern and complete factory building of steel and concrete. Special attention is being given, in these plans, to insure the comfort of the employees, who will have a beautiful tile swimming pool, library, restrooms and other conveniences where they can retire and read or play during their luncheon period, and have the privilege of meeting if they desire, for entertainments and games after working.



Every Spring Sent Out from the Jenkins Vulcan Spring Plant Bears an Envelope Containing a Postal Card Like That Shown Above, Which the Dealer Returns to the Factory. Ordinarily, of Course, the Numbers on Both Envelop and Card Are Identical.

Facts and Ideas in the Tire World

An All-Rubber Tire-Tube Patch Appears on the Market.

An all-rubber patch, for repairing punctures and blowouts, and claimed to have unusual adhesive properties has been put on the market by the Triangle-Runner Co.

The Triangle tire patch is said by the makers to be made of pure rubber—has no

fabric—is self-vulcanizing and once on, the tube may be replaced and pumped up immediately. It comes in three sizes and can be used for repairing any other rubber goods besides tubes.

The Triangle Rubber Co., Oklahoma City, Oklahoma, also sells Triangle casing patches and Triangle radiator cement. Write to them for an illustrated leaflet, mentioning American Garage & Auto Dealer.

New Price List of Rubber Products Is Announced.

Zwebell Brothers Co., manufacturers of dry cure retreading and sectional molds, has recently issued a new price list of rubber products, tire shop accessories, tools and tire material to the trade.

Some of the products listed are: tire mandrels, tread rollers, rotary rasps, corrugated stitchers, awls, knives, fabrics, liners, and cements. Price lists can be obtained by writing to Zwebell Brothers Co., 482 Milwaukee St., Milwaukee, Wis., and mentioning American Garage & Auto Dealer.

Mohawk Expands Facilities for Pacific Coast Trade.

The Mohawk Rubber Co., of Akron, Ohio, is showing great activity on the Pacific Coast. M. E. Mason, secretary and sales manager, says the increase in business has made it necessary to practically double the San Francisco branch facilities.

W. G. Fitzgerald, formerly Mohawk representative in Kentucky, now has charge at San Francisco. The Jensen-King-Byrd Co., 320-324 Riverside Ave., Spokane, Washington, is now Mohawk distributor, and Munnell-Sherrill, of 40 First St., Portland, Oregon, is also a Mohawk distributor.

Caution to Repairmen When Thinning Rubber Cement.

It might be well for the proprietor of a repair shop to caution his tire repairman to avoid thinning rubber cement with ordinary gasoline. This ingredient contains altogether too much oil to be safe for that purpose, for of course oil, of any character, is a deadly foe of rubber. Use instead either high-test gasoline or bisulphide of carbon for thinning rubber cement.



Attractive Package in Which the Triangle Tire Patch Is Supplied to Trade.

Suppose You Were Offered 20% Discount Off Your Tire and Gas Bills!

If your dealer offered you that, would you pass it up? **YOU WOULD NOT.**

If we tell you that through actual experience, the Burgess Rebound Check and Shock Absorber has proven its ability to cut tire, gas and wear and tear bills even more than 20%, will you pass this up? **YOU SHOULD NOT.**

The Burgess "Triple Duty" Absorber is not only worth real dollars and cents to you in savings, but it also takes up every jolt and jar, and makes it a pleasure to travel the roughest roads in your Ford car.

Every day you drive without a set of Burgess "Triple Duty" Rebound Check and Shock Absorbers is costing you Money and Comfort.

Write us today for further particulars.

Manufactured and
Guaranteed by

**Walter S. Burgess
Mfg. Co.**

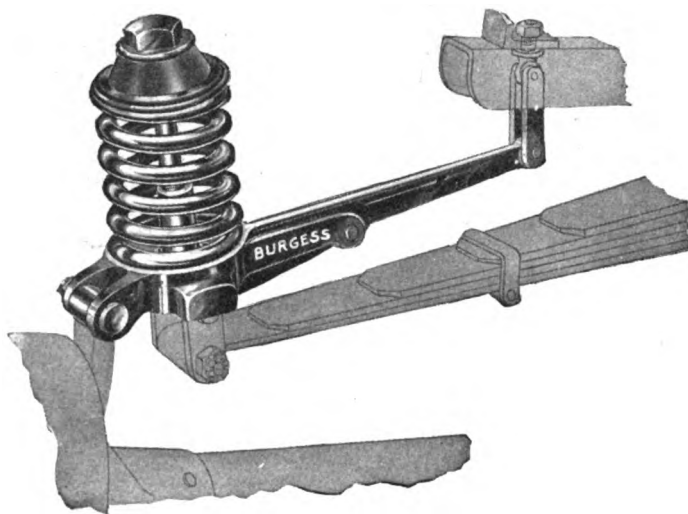
St. Joseph, Michigan

Sales Department:

The Zinke Co.

1323 S. Michigan Avenue

Chicago, Illinois



BURGESS

PATENTED

"TRIPLE DUTY"

REBOUND CHECK AND SHOCK ABSORBER

ZELNICKER Ever-Tyte PISTON RINGS

WRITE for Booklet
No. 32. It's
full of valuable
automobile
information
worth
knowing.

*After an eight months' laboratory test,
combined with a 25,000-mile road try-
out, were adopted by one of the most con-
servative automobile manufacturers in
America in their standard production.*

Zelnicker Ever-Tyte Piston Rings are scientifically built in three parts. The patented right-angle interlock permanently seals the joint while the six-point circular expansion provides perfect contact with the cylinder wall at all points, even though "out-of-round."

THE EVER TIGHT PISTON RING COMPANY
3174 LOCUST STREET, ST. LOUIS, MO.

Garage and repair men recognize merit and efficiency. As a result Zelnicker Ever-Tytes are sold by almost every repair shop or garage.

If yours is an exception, send us his name and address and we will see that you are promptly supplied.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Truck Salesman Should Know His Customers Transport Problems.

That the sale of a motor truck is not completed with an argument on the merits of the products, but that the salesman must go further and know the transportation problems of his customer is a contention of George D. Wilcox, director of sales and advertising of the Commerce Motor Car Co. In a desire to see truck merchandizers obtain the highest transport efficiency, this official has written to the University of Michigan offering to employ either for the factory or for Commerce distributors and dealers all graduates from the Ann Arbor institution's newly created Highway Transport Department.

The University of Michigan is the first great university to recognize the great developments in the carriage of cargo over highways, having added a highway transport course which will be varied in character. It will fit students for important positions in the motor truck field.

The course embraces the problems of the motor truck thoroughly along construction, merchandizing, and automobile engineering lines as well as various phases of the transportation question as presented by the Department of Economics. These courses develop the student into an all around transportation expert. The highway Engineering Course, as it is now recognized, treats with the road-bed and its relation to the highway vehicle that travels on it. They are as closely related as the rolling stock and the road-bed of the railway line.

"The ordinary passenger car salesman is not an efficient truck salesman" Mr. Wilcox declares. "To sell motor trucks and maintain a close relationship with the customer the salesman must know something of his transportation problems and be able to give advice on that subject at all times.

"The customer wants to know how he can add a truck to his business and make it a paying investment. He is more interested in costs, service and returned remunerations than he is in comforts and refinements.

"The ending of the war is bringing into commercial life a large number of men with practical training in motor trucks. The course they received, both as members of the Motor Transport Corps or the Ordnance Department of the War Department, has aroused their interest in trucks. They will come into commercial life keen to enter the selling field of motor trucks.

"The University of Michigan now offers a rare chance for men inclined to merchandizing trucks. While they may have the knowledge necessary to bring out the sales points of the product they sell, this University of Michigan course would graduate them from the ranks of the ordinary

salesman to that of transportation engineers. We have a few such men in the industry today who enjoy immense salaries.

Federal Aid Permits States to Build Suitable Roads.

Started mostly as an experiment in 1916, when Congress appropriated \$75,000,000 to be used over a period of five years to aid the States in the construction of post roads, Federal aid for highways has developed into a magnificent certainty. The appropriation of \$229,000,000 by the last Congress, to be placed at the disposal of the States whenever they meet this appropriation at least dollar for dollar to build roads, proves that the public interest has been aroused.

In March alone, the States submitted 110 new projects, involving a total expenditure of \$17,558,610.07 for the 1,263 miles of improved highways. For this the Federal aid allotted by the Secretary of Agriculture, who administers the Federal aid road act, was \$6,739,839.11. Thirty-eight States are represented in this boom in road building.

There are approximately 2,500,000 miles of highway of all kinds in the United States. Of this amount 11 per cent is improved. The war demonstrated that highways have become one of the greatest essentials in the commerce and prosperity of the nation. The railroads being utilized to their utmost in the carrying of men, munitions and food, it was necessary to resort to highway transport.

Burden Too Great.

Roads designed ordinarily to meet every requirement of traffic at the time they were built and the natural increase in volume and weight of traffic that could be anticipated for the life of such highways, were called upon to bear a burden much greater than they could carry. Light trucks disappeared over night to be replaced by trucks of the greatest carrying capacity, the single truck was superseded by fleets of freight-carrying motor vehicles, speed increased by necessity to the limit, and naturally the ordinary roads crumbled under the immense pressure.

Federal aid in the hundreds of millions granted, will not only restore these roads, but will make it possible for the States to design and build such highways as will carry not only that which they must bear now, but the ever-increasing loads that will come in the generations that they will endure.

Almost 90 per cent of all the automobiles in the world are running on the roads of the United States. On January first this year, there were registered in the forty-eight States 6,146,677 motor vehicles, exclusive of motorcycles, and 107,000 trucks and passenger cars manufactured for and delivered to the Government. This means that there is in the United States one motor car for every sixteen people, more than

one for every one-half mile of public roads, and that if crowded to full capacity they could carry all the men, women and children in the country in two loads.

Without adequate roads built to carry this traffic, which within a year was increased by more than 1,100,000 motor vehicles, they are useless. Without roads, which become the right-of-way for motor trucks, the hundreds of thousands of such vehicles which ten years ago were almost a curiosity, would become junk. Without Federal aid freely extended, the States would find it almost impossible to provide these highways. Federal aid makes it possible for two miles of highways to grow where only one grew before.

At one letting, covering two days' examination of bids, the State of Pennsylvania recently awarded contracts for the construction of highways exceeding \$2,000,000 in cost. Towards this expense the Federal Government is asked to contribute nearly \$1,000,000. This State plans to use upon its highways this year 35,000 men. If other States, many of which have just as ambitious highway programs, employed men in equal proportions, more than 600,000 men would find employment in this field.

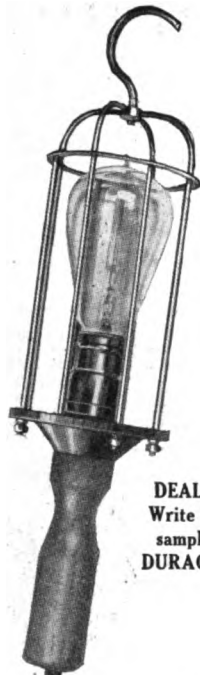
Federal aid means to the farmer increased land values through the betterment of roads, greater profits on the products of his land through decreased cost of transportation; to the city man a lower cost of living, a greater facility of communication with the source of his supply, a vast reduction in the cost of transportation by passenger cars, in the saving of gasoline and equipment through travel over better roads, and to the country a sense of security in that its means of communication will be the highest type and make easy the transport of all that is necessary in times of stress.

Motor Truck Movements.

George C. Sherman, president of both the Universal Tobacco Machine Co. and the advertising agency of Sherman & Bryan, Inc., has replaced W. F. Melhuish, Jr., as president of the Fulton Motor Truck Co. F. G. Saunders, until recently vice-president of the Army Bank in San Antonio, Texas, has been elected treasurer. Carl H. Page, who was formerly New York sales manager for the White Company and distributor of Chalmers and Mitchell cars, has been elected vice-president in charge of sales and advertising. W. R. Bamford, formerly of the Olds Motor Works and of the Hupp Motor Car Co., is in charge of production, and C. M. Kraham, formerly assistant sales manager of the Republic Motor Truck Co. is assistant sales manager. C. M. Strieby is assistant manager of advertising. Continuing as vice-presidents are J. C. Kuhn and W. S. Palmer. The latter is also secretary.

* * *

P. C. Chrysler, former manager of the Philadelphia branch of the Hurlburt Motor Truck Co., has been appointed director of the wholesale department of Hurlburt Motors, Inc. The latter concern was formed recently to take over the distribution of Hurlburt Trucks.



DEALERS
Write for a
sample of
DURACORD

A better, stronger extension lamp with a different kind of cord

USERS of portable hand lamps have suffered so long from the necessity of using poor lamp-cord that they have come to accept it as inevitable—like death and taxes.

Surely the cord is of the utmost importance when danger of fire from short circuit and of accident from electric shock is considered.

You can now get this complete Duracord Extension Lamp all wired up ready for use. Everything except the bulb.

Duracord has a heavy *woven* covering like a piece of fire hose that will outlast ordinary cords several times. It is gripped in the handle by a patented "holdfast" fitting—no strain on the wires or the terminals.

Each lamp in an individual box, complete. See them at your dealer's.

Prices

| | | |
|-----------------------------|-------|--------|
| Light weight | - - - | \$5.00 |
| Heavy duty (as illustrated) | - - - | 6.00 |
| Vapor proof | - - - | 8.00 |

TUBULAR WOVEN FABRIC CO., PAWTUCKET, R. I.

DURACORD

EXTENSION LAMP



*Introducing the
Latest Idea*

ROTARY AIR COMPRESSORS

For All Purposes

ADVANTAGES WORTH CONSIDERING

Slow Speed. No Vibration. Positive Displacement.
High Overall Efficiency. Very Low Cost of Upkeep.
No Expensive Foundations.

Easy to Install. Perfectly Balanced. Quiet in Operation.

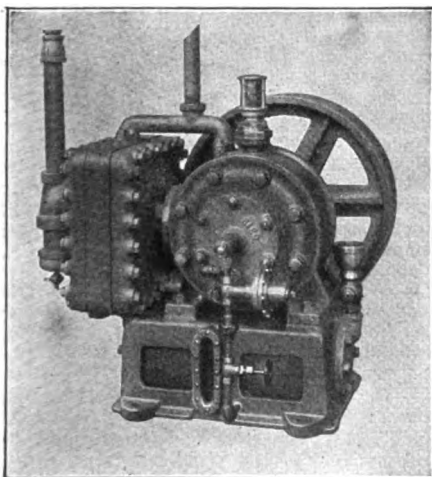
Check Valves on Discharge. No Valves on Intake.
Simple to Operate.

*Weights Less Than One-Half of Other Types.
All Bearings Hyatt Roller—"High Duty." Only
Five Moving Parts Always Running in Oil.*

Write for Descriptive Matter, Prices and Delivery

JACKSON COMPRESSOR COMPANY

Denver, Colorado, U. S. A.



Rotary Garage Compressors

Accessories and Garage Equipment

NEW QUICK-LIFT SERVICE JACK FOR USE WITH FORD CARS.

The White Products Co., of 100 West 55th street, Chicago, announces a new service jack or jack truck for the quick handling of service work on Ford cars. The cut shows this jack as it appears with the handle raised.



White Products Jack Ready for Lifting.

ready for the arms to be placed under the Ford rear axle. As the handle is lowered, the car raises.

One stroke lifts the whole rear end from the floor. A safety lock holds the handle in position while the car is raised. The jack is mounted on roller bearing casters, making it easy to move the Ford to any location desired. Circulars, trade prices and full information gladly mailed on request to dealers who mention the American Garage & Auto Dealer when writing.

NEW POCKET AMMETERS AND VOLT-METERS ON THE MARKET.

New pocket type, direct current "Handy" ammeters, voltmeters and volt-ammeters, designed with the idea of accuracy, reliability, compactness and lightness have recently been announced by the Roller-Smith Co. The line comprises milli-ammeters and ammeters up to 50 amperes; milli-voltmeters and voltmeters up to 150 volts; and volt-ammeters up to 50 amperes and 150 volts, all self-contained. These ranges can be increased by the use of appropriate shunts and multipliers.

The description states that the mechanism is of the permanent, moving coil type, the magnets are two in number, well aged and of high grade tungsten steel. Jewels are carefully selected Ceylon sapphires, and the pivots are hardened steel accurately ground and polished. The springs are accurately formed and well aged and the entire mechanism is mounted on one base, thus insuring correct alignment of parts at all times.

The case is drawn brass with a rubberoid finish, while the base is of select, close

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....

.....

Name

Address

grained wood which will not warp. The dimensions of the "Handy" are four inches wide by five inches high by two inches deep and the average weight is twenty ounces. Leather carrying cases are available when wanted. For descriptive circular and trade prices write to Roller-Smith Co., 233 Broadway, New York, mentioning American Garage & Auto Dealer.

NEW PUMP CONNECTION GRIPS THE VALVE STEM.

A new pump connection, called the Thumlock, which is simple and positive in operation has recently been put on the market by Stevens & Co. It consists of a nozzle with a pipe-shaped rubber washer which grips the valve stem by means of compression applied through a lever. Thumlock is simply slipped over the valve stem and the lever lowered; this, so the makers claim, locks the washer and makes it air tight, and you can pump to any pressure needed. When through the lever is raised and Thumlock is lifted off.

Dealers can obtain a counter display card of twelve Thumlocks by writing to Stevens & Co., 375 Broadway, New York, and mentioning American Garage & Auto Dealer.

COLE STORAGE BATTERY CONCERN ENLARGES PLANT.

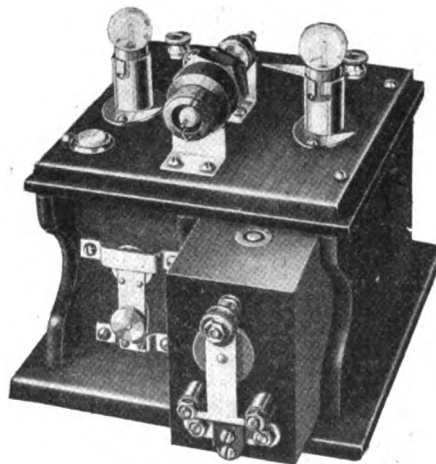
Improvements to the new addition of the Cole Storage Battery Co. plant at Chicago have been completed which provide 14,000 square feet of production space. The concern has purchased ground on which it will erect a new plant in the near future.

The additional factory is at 2435-2441 Indiana avenue. The general offices of the company will be maintained at Indiana avenue and 24th street until the new plant is completed, according to Sales Manager T. A. Cressey of the Cole concern.

TESTER OFFERED FREE TO LIBERTY SPARKPLUG DEALERS.

Automotive dealers who handle the Liberty sparkplug have an opportunity to obtain a neat testing device. The little machine can be placed on a counter or show-case and should help greatly in making sales of sparkplugs.

The tester may be used to test sparkplugs, automobile lamps, horns and Ford coils. The device has been found useful in a score of ways by accessory dealers and garagemen who have installed them in their establish-



Free to Liberty Sparkplug Dealers. Tests Sparkplugs, Automobile Lamps, Horns, Ford Coils and Useful in Other Ways.

ments. Full details of the free offer can be obtained by writing to the Casey Hudson Co., 361 East Ohio street, Chicago, maker of Liberty sparkplugs, and mentioning the American Garage & Auto Dealer.

JEFFERSON TRANSFORMER ELECTRIC TAIL LIGHT FOR FORD CARS.

Every Ford owner will be interested in the transformer tail light recently perfected by the Jefferson Electric Mfg. Co. The device has become popularly known to the trade as

"The tail light that never fails." It eliminates all excuses for a faulty Ford tail light. A complete standard electric tail light with four candlepower bulb, a compact, sturdily constructed transformer, and enough rubber covered wire to complete the simple installation comprises the outfit.

The light is operated by the waste electric current from the Ford generator, which passes through the transformer and insures a uniform tail light brightness regardless of the speed of the engine. It is the only transformer operated electric tail light on the market for Ford cars, and the only device



Jefferson Electric Transformer Tail Light

for its purpose requiring but one bulb. Neither is there a resistance coil to burn out.

When the motor is stopped a switch on the face of the transformer is thrown to the battery side and tail light is kept burning brightly by two dry cells. Batteries will last all season with the low amperage lamp that is used. The simple installation fully explained in the instructions accompanying each device can readily be completed in fifteen minutes. For further information and descriptive matter write to the Jefferson Electric Mfg. Co., 426-430 S. Green street, Chicago, Ill., mentioning the American Garage & Auto Dealer.

Automatic News Notes.

President Franc D. Mayer of the Essenkay Products Co. has gone to England where a plant is being erected to produce Essenkay tire filler for distribution in Great Britain and its colonies. He is expected to return home about Sept. 15.

Clinton B. Amorous, until recently a major in the United States air service, has been appointed manager of the Chicago branch of the Locomobile Co. of America. He was formerly an assistant purchasing agent at the Locomobile plant in Bridgeport and later was in charge of the Detroit plant of the Parish Mfg. Co.

Charles G. Guild has been appointed secretary and service manager of the Wayne Oil Tank & Pump Co. He succeeds Clayton O. Griffin, whose resignation after ten years' service with the concern was accepted with much reluctance by the officials of the Wayne company.

H. A. Flogaus has been appointed to the engineering force of the Malbohm Motors Co., which recently moved from Racine, Wis., to Sandusky, Chio.

J. H. Malone has resigned as advertising director of the Chilton publications, Philadelphia, to become vice-president and general manager of the William F. Hudson enterprises.

J. G. Loeffel has been engaged to represent the Hudson Motor Specialties Co. in the states of Illinois, Iowa, Minnesota and Wisconsin.

**Here's The Way To Make
\$200 to \$500
Extra Profits Every Month**

We Give You Absolutely Free!

With each machine an assortment of 1,000 Ewald Special Staples—more than enough to staple enough tires to pay for the entire outfit!

Get it now and begin to make real money

Write us today and get started towards big profits. Our extremely low list price of \$20.00 is subject to an attractive trade discount—you can make enough the first day to pay for it all. Repairmen and garagemen are making as much as \$20.00 a day with the Ewald. Act now—every day you delay is money out of your pocket.



TRADE MARK
Ewald
Tire Retreader
Outfit

M'd by
ROMORT MFG. CO.
Oakfield, Wisconsin
Sales Dept.
THE ZINKE COMPANY
1325 Michigan Avenue
Chicago, Ill.



Here's More That You Get Absolutely Free of Charge!

- 1 FULL SHEET OF DIRECTIONS
- 1 CAN OF MICA TIRE POWDER
- 1 TRACING WHEEL
- 1 NOTCHED KNIFE
- 1 TIRE SPREADER
- 1 CEMENT BRUSH
- 18 FT. RELINER STRIP
- 1 CAN OF CEMENT

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

Price F. O. B. Factory \$10.00

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Maxwell, Overland, and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.



Automotive News Notes.

The Allen Motor Co. has increased its capital to \$3,000,000 and moved its plants from Fostoria and Bucyrus to Columbus, Ohio. The Scoto Rubber Co. has been absorbed and the plant formerly used by the Columbus Buggy Co. will be used as the Allen factory.

* * *

Fred W. Jones has been appointed advertising manager for the Holt Mfg. Co. of Peoria, Ill., maker of caterpillar farm tractors. In order to take up his new work Mr.

Jones resigned from the advertising department of the International Harvester Co., where he had supervision over advertising in trade and farm journals and newspapers.

* * *

Harry H. Hawke, general sales manager for the Traffic Motor Truck Corporation, St. Louis, announces the appointment of J. Albert McCollum as advertising manager. Mr. McCollum, for many years has been in charge of the automobile advertising of the St. Louis Republic. G. Elmo Holke, assistant advertising manager, will remain as such

and edit the company's house magazine "Horse Sense."

* * *

John Doherty, formerly president of the Acason Sales Co., Philadelphia, has joined the H. Kleinhans Co., Pittsburgh, and will have charge of the Acason truck sales of this concern.

* * *

The Lance Motor Car Co. of Reading, Pa., has opened a distributing house in Philadelphia and will handle Commerce trucks in both cities. The firm's name will be changed to Lance Motor Truck Co.



Tire Applying Press

Hydraulic Arbor Presses

work easier
than any
others.

We make
many sizes
for many
purposes.



WRITE FOR CATALOG

Lourie Manufacturing Co.
SPRINGFIELD, ILL.

The AUTOMATIC and the REPEATER GREASE and OIL GUN



Improved self measuring meter—*absolutely accurate.* Can furnish either in Air Pressure, or Crank Operated

Used by U. S. and by nearly all Motor Car Manufacturers and by thousands of Garagemen.
Capacity 25 lbs., 50 lbs. and 100 lbs.

**Saves Time
Saves Lubricant**

Sold by over three hundred jobbers and wholesalers.

Write to us about it.

H. M. BOE MFG. CO.
Minneapolis, Minn.



That New Air Compressor—Are You Considering It with Due Seriousness

FOR every dollar invested in an air compressor the purchaser should expect maximum returns—excellent service from the first day—a surplus of capacity in times of greatest stress—ability to deliver without taxing the strength of compressor or motor—freedom from repairs and continued satisfactory service for years to come.

Greatly changed conditions exist today. Instead of a maximum need to supply from 80 to 90 pounds of pressure the need now runs from 55 pounds in small tires to 110 and upwards to 160 pounds in gigantic truck tires—instead of being used infrequently the need is now almost constant—instead of having time for maintenance of equipment the time of attendants is now taxed to the limit. All these conditions combine to demand the most efficient and fool proof equipment available.

**8 to 10 in
Pneumatic Tires
110 to 160
Pounds
Pressure**

The equipment utilizing
the Improved Two Stage
Principle—

The compressor with 14 improved
features—

The compressor designed for the highest
of high pressure service—

The machine adopted for war camp service by
the Government—

The machine with which everyone should be familiar is the

Usaco
AIR COMPRESSORS
TRADE MARK

De Luxe
Two Stage

Automatic Air Compressor

MANUFACTURED BY

The United States Air Compressor Co. 6542 Carnegie Ave.
CLEVELAND, O.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



**This pretty beach bather
is a graceful swimmer—
yet the ease with which she swims,
is also characterized by the
ease with which your customers
can drive, if equipped with.
W & C SHOCK ABSORBERS**

At no time have W & C Shock Absorbers failed to make good, either in profits for the jobber and dealer, or in service for the owners of a Ford.

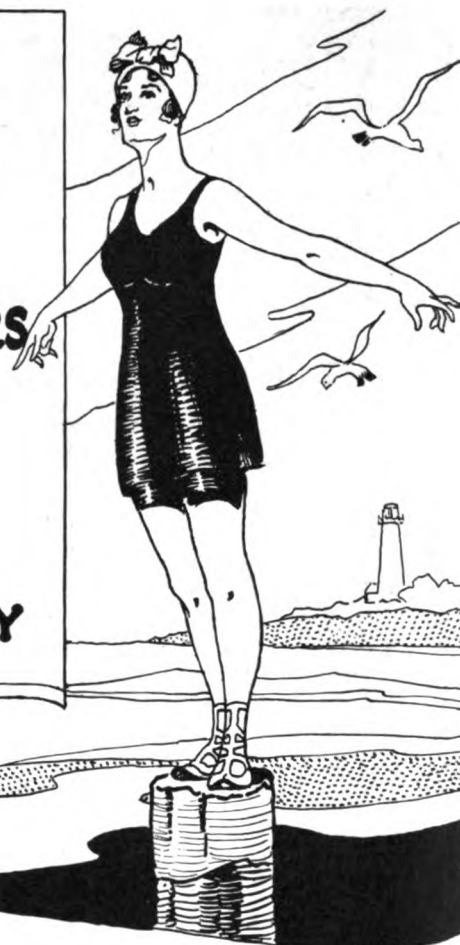
At present more than 200,000 sets of W & C Shock Absorbers have been sold.

The jobber, the dealer, and the owner prefer W & C Shock Absorbers because they invariably please.

*Your jobber can furnish you,
otherwise write us direct.*

Price still \$10.00 per set of four

P. H. WEBBER COMPANY
HOOPESTON
ILL.



**"Yes, that's the trouble,
but the ROSE TIRE PUMP
does not have a brass barrel
and will not dent or
jam in the tool box."**

"Is the base cast iron?"

"It is not. The base is machined from solid screw stock and the stirrup folds along side the barrel."

"Will the barrel rust?"

"Most assuredly not. The barrel is enameled and baked."

"How about that hose?"

"That hose, my dear sir, is the best I ever saw on any pump, 17/32 outside measurement and 3/16 inside with an inner wall of pure para rubber and 5-ply extra tested fabric."

"Many Rose Tire Pumps sold?"

"Over 1,500,000 in use. Nearly every jobber and dealer in the United States stock Rose Tire Pumps and a full line of repair parts for them."

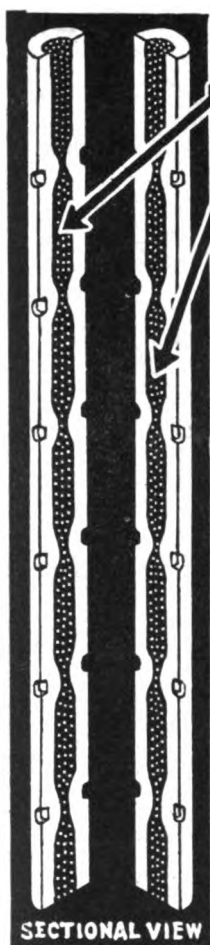
"That looks good to me. I'll just take it along. How much money?"

"Only \$3. and you have a pump that will give you satisfactory service for five years. By the way, how much service did you get out of the pump you got with your car?"

"Eh? Service, did you say? You can guess. I must go, the folks are waiting. Good-bye."

Manufactured and Guaranteed by

J. H. HANEY & CO., Hastings, Nebraska



"FLUX-LINED" SOLDER

is the principle of this solder that eliminates half of the work and most of the difficulty of a soldering job.

KESTER ACID-CORE WIRE SOLDER

does away with the acid pot and the bother of hunting, carrying, and applying the flux. The core of the solder tube is the soldering flux, which feeds with the solder—without waste of either.

Sold in 1-lb. coils in cartons, and on 1, 5, and 10 lb. spools.

Order from your jobber.

Chicago Solder Co.
CHICAGO - U.S.A.

Also Mfrs Kester Rosin-Core Wire Solder.

GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company

1002 Washington Boulevard
Chicago, Illinois



"AM-PÉ-CO" PRODUCTS

Sell readily because their superiority is well known to the Motoring Public

"AM-PÉ-CO" PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. "AM-PÉ-CO" Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes.

We also make the famous "AM-PÉ-CO" WHEEL PULLERS and BRAKE SHOES, both one- and two-piece.

If your jobber does not handle "AM-PÉ-CO" Products, write us direct.

F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

General Selling Agent for

**American
Machine
Products
Co.**

Marshalltown,
Iowa



"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."

Approved by the Underwriters' Laboratories, and affords 15% discount on insurance.

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

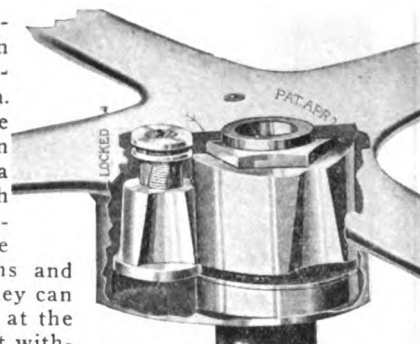
Write today for particulars.

THE RELIANCE COMPANY

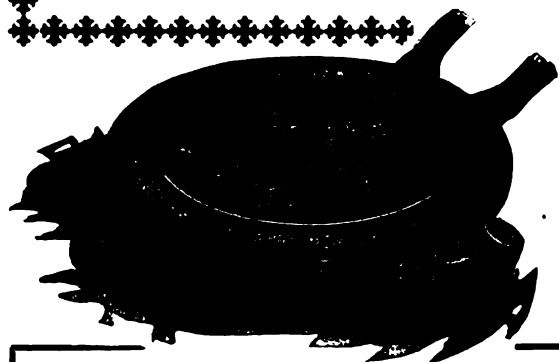
411-417 So. Sangamon St.,

CHICAGO, ILL.

Distributors in every state



End Your Tire Trouble Forever



IT brings new happiness and releases you from the horrors of expected tire trouble, making your car more delightful. Think of the joy of riding along without the eternal fear of a puncture or blow-out. Think of getting 10,000 to 20,000 miles out of every tire—no vulcanizing, no patching, no repairing of any kind, doing away with your inner-tube forever by installing in your tires this wonderful and economical

National Rubber Tirefiller

This marvelous substitute for air is being used by thousands and thousands of satisfied car owners throughout the United States and many foreign countries. We have been manufacturing and selling it for more than seven years; selling last year more than 35,000 sets.

National Rubber Tirefiller is made of the best grade of rubber, cut in small particles, treated, molded and vulcanized by our special steam process, in sizes to fit all standard makes of tires. It is laid in your tires and not melted and poured in. It can be transferred from one tire to another. It will not freeze, melt or harden—fully guaranteed against deterioration in any form, or being affected by atmospheric conditions.

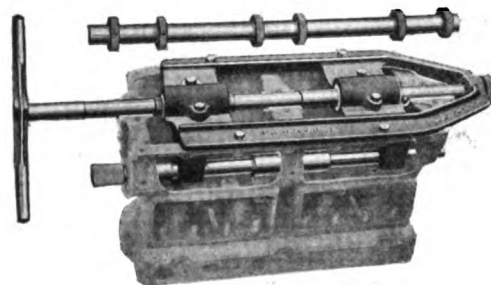
Don't let prejudice stand in your way. Good business judgment demands that you at least make a careful investigation. Let us send you full information, sample and prices.

DEALERS—We have a fine proposition for you.

National Rubber Filler Company
210 College Street Midlothian, Texas

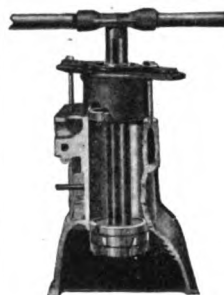


makes substantial "profits" for the garage and insures every day being a busy day



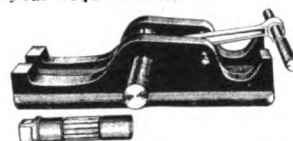
STORM MAIN BEARING BABBITTING AND BORING TOOL

Puts new bearings in old Ford Blocks. A simple and efficient tool which produces a perfect bearing in proper position and in perfect alignment, the same as a factory job.



STORM REBORER MACHINES

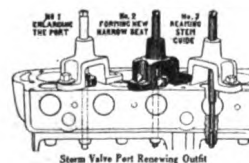
The garageman's best friend and biggest money maker. Made in varied capacities to meet your requirements.



STORM CONNECTING ROD BEARING REAMER, JIG AND STRAIGHTENING GAUGE

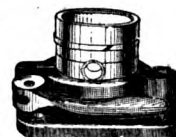
Makes accurate fitting bearings and insures perfect alignment. With it your cheapest man can do expert bearing work.

Write for Bulletin No. E 42



STORM VALVE PORT RENEWING OUTFIT

Renews the Ford valve port as it should be. Enlarges the port, makes a new narrow seat and new stem guide.



STORM MFG CO.

406 6th Ave. South, MINNEAPOLIS, MINN.

STORM PISTON VISE



**It's a happy
garageman
who has a
HOLMES
WRECKING
TRUCK**

This advertisement actually expresses the attitude of hundreds of garagemen and repairmen who have a **HOLMES WRECKING TRUCK**.

Regardless of the wrecked condition of the car, it can be readily "towed in" with a **HOLMES**.

Staunchly built, frame and wheels of malleable iron castings. Hyatt roller bearing for wheels and tongue of second growth ash.

PRICE, \$50.00
Special Discounts to Garages and Dealers.

ROBERT HOLMES & BROS.
DANVILLE, ILLINOIS

No wasted "Free Air"

SNAP! When the inflating valve is removed the **AIR PRESSURE STOPS**

All garages and repair shops distributing free air can profitably use the

SCHRADER



**UNIVERSAL
INFLATING
VALVE**

If you have a **SCHRADER** valve you know that your "bottled air" is safely tucked away the minute it is taken off the tire valve. The air is released by pressing the nozzle of the inflating valve against the tire valve, and stopped by removing the device from the tire valve. Fits any diameter of hose from $\frac{3}{4}$ to $\frac{5}{8}$ inch. **Price, \$1.50.**

A. SCHRADER'S SON, Inc.
783-793 Atlantic Ave., Brooklyn, N. Y.

Instead of trusting to *memory* depend on the **CALCULAGRAPH**

No successful business man can trust to his memory alone for the proper conduct of his business. Neither can any garage man and repairman intelligently charge customers for work unless they have an accurate method for computing time charges—such as the **CALCULAGRAPH**.

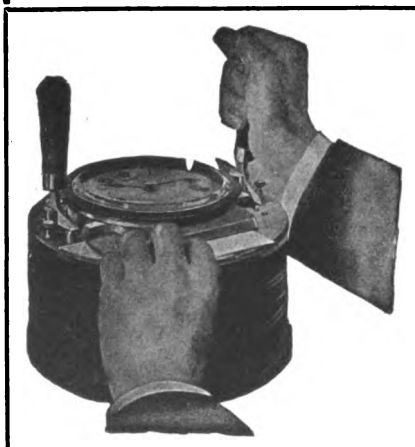


By reason of its use in many of the best garages in the United States, the **CALCULAGRAPH** has demonstrated that it is the most satisfactory method for timing repair work.

**It computes
elapsed time**

*Descriptive literature
on request.*

**CALCULAGRAPH
COMPANY**
Dept. 77
30 Church St.
New York City



Pondelick Brothers

will
pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrounding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

Sell this extraordinary pump **JENSEN TIRE PUMP**

Pumps of high quality are scarce nowadays. One that will produce 90 lbs. pressure with one-fourth the energy expended on the ordinary vertical pump to get 75 lbs. is still more rare.

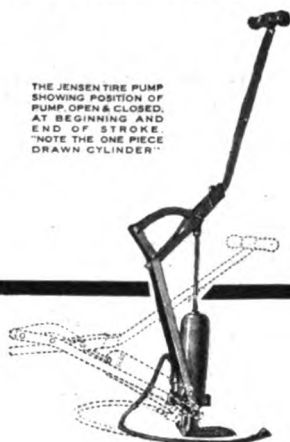
A JENSEN will accomplish this. "There's no use talking"—the JENSEN TIRE PUMP is a REAL seller.

DEALERS, supply your trade with a JENSEN. Write now.

Price \$5.50

**W. H. HOWELL
COMPANY
GENEVA, ILL.**

THE JENSEN TIRE PUMP
SHOWING POSITION OF
PUMP, OPEN & CLOSED,
AT BEGINNING AND
END OF STROKE.
"NOTE THE ONE PIECE
DRAWN CYLINDER"



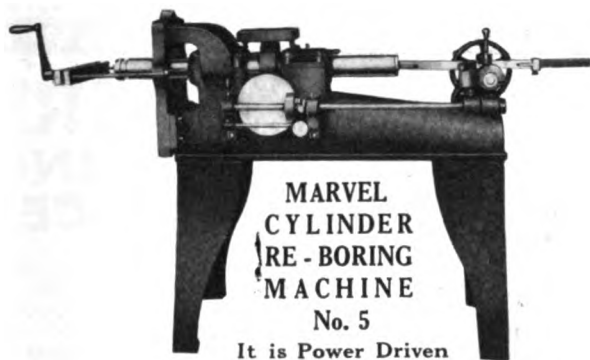
**As your speedometer tells you
your speed, the Jewell tells
the condition of your battery**

Tells you at a glance, the exact condition of your battery. Protects it from short circuits, failure of charging currents on low water. Eliminates repeated messy hydrometer tests.

Ask your dealer or write to us.

JEWELL ELECTRICAL INSTRUMENT COMPANY

1650 West Walnut Street, Chicago



The MARVEL Soon Pays for Itself, After That It Is All Velvet

You owe it to yourself to investigate this wonderful business builder and money maker at once.

THERE IS NO OTHER MACHINE LIKE THE MARVEL No. 5

It is accurate—speedy—automatic—reliable and simple.

It handles anything from a motor cycle to a tractor.



Write for full information—let us show you what a simple matter it is to equip your shop to re-bore engine cylinders and fit them with MARCO OVER SIZE PISTONS, and how easy it is to get the business.

Don't put it off—write today.

MARVEL MACHINERY COMPANY
307 S. Third Street Minneapolis, Minn.
In Writing Please Use Address in Full—It Expedites Delivery

Triangle Tire Patch Makes More Money For Dealers



When you sell a package of Triangle Tire Patch you sell a darn good patch—one that will do the work and bring repeat sales. You also pocket a nice profit, because you save the jobber and salesman profits by buying direct from the factory.

We stand behind this guarantee—your money back if the patch comes off.

There is more money for you in selling this patch and there will be more satisfaction for your customers in using it.

Fire us the coupon below. We'll shoot you the figures.

TRIANGLE RUBBER CO.
OKLAHOMA CITY, OKLA.

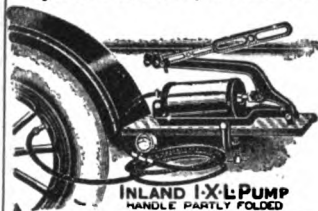
CLIP THIS COUPON FOR PROFITS

Triangle Rubber Co., Dept. D,
Oklahoma City, Okla.

Send your direct-to-dealer proposition on Triangle Tire Patch to

When selling tire pumps why not sell the best
INLAND I. X. L. PUMPS

are unequalled for power, compactness, long service and ease of operation. This running board pump develops a leverage of 18 times the ordinary foot pump yet a woman or child can operate it with ease. Strongly made of the best materials. Cylinder is a drawn steel shell absolutely air tight. Clamps securely to the running board. Handsomely finished making a neat appearance.



DEALERS—This pump is a real seller because it makes good. Write today for prices and particulars.

Universal Mfg. & Sales Co.
 550 W. Harrison St., Chicago

ATTENTION

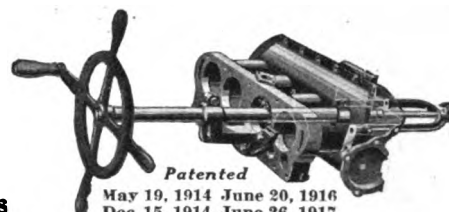
Garagemen, Dealers and Mechanics

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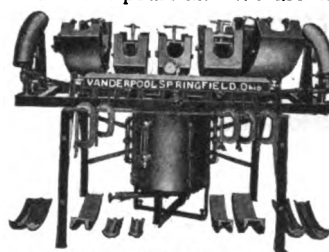
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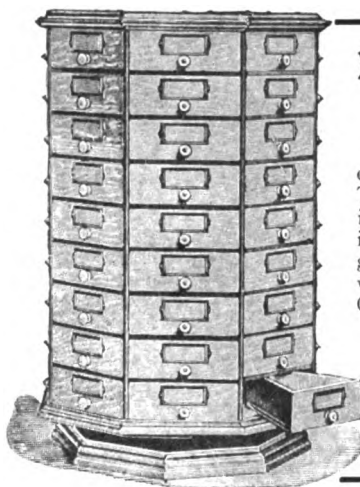
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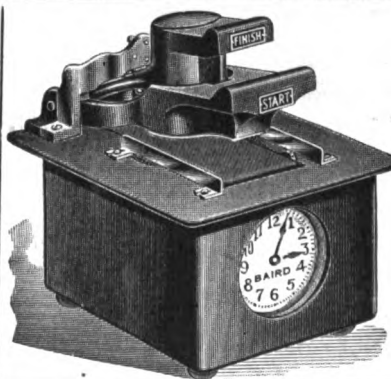


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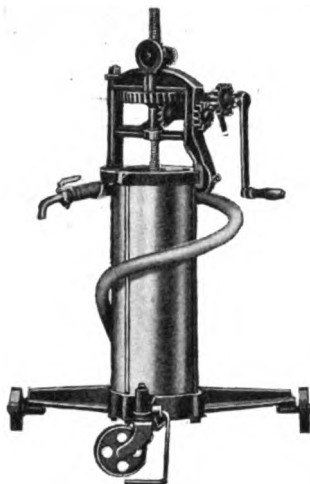
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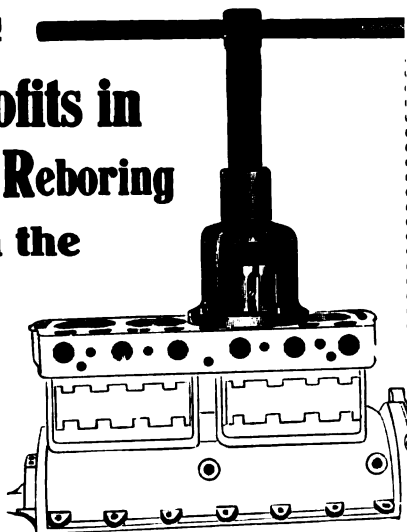
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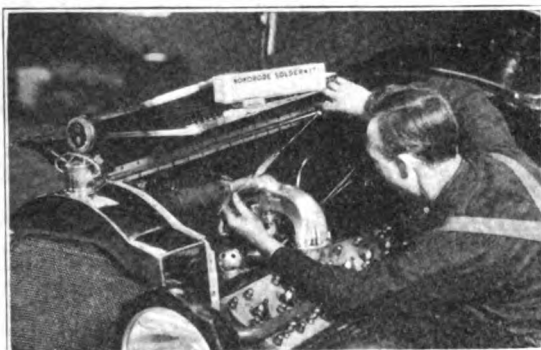
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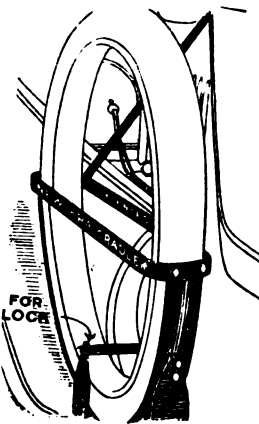
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WRENCHES

Auto Compressor Co., Wilmington, Ohio.
The Graham Roller Bearing Co., Coudersport, Pa.

Index to Advertisements

A

Advance Automobile Accessories 5
American Bolt & Screw Case Co. 72
American Machine Products Co. 68
Atlas Auto Supply Co. 8
Auto Compressor Co. 39
Auto Engine Works. 74
Auto Parts Co. 74
Auto Spring Repair Co. 75
Auto Wrecking Co. 74
Automatic Safety Tire Valve Corp. 43

B

Baird Equipment Co. 72
Beck & Corbitt Iron Co. 75
Bermo Co., A. J. 72
B. & M. Mfg. Co. 66
Boe Co., H. M. 59
Brunner Mfg. Co. 59
Buetner Co., Chas. H. 74
Butler Mfg. Co. 61
Burgess Mfg. Co., W. S. 61

C

Calculagraph Co. 70
Cassidy Co., Edward A. 51
Catelain, Andre G. 74
Champion Pneumatic Machinery Co. Inside Back Cover
Chicago Baling Press Co. 68
Chicago Solder Co. 68
Curtis Pneumatic Machinery Co. 33

D

Dayton Electrical Mfg. Co. —
Denby Motor Truck Co. —
Detroit Auto Radiator Co. —
Dunton Co., The M. W. 73

E

Eccolene Company —
Ever-Tight Piston Ring Co. 61

F

Federal Electric Co. 77
Flexlume Sign Co. Back Cover
Foster Bros. Mfg. Co. 75
Franklin Mfg. Co. —

G

Ganschow Co., William. 68
Garden City Spring Works. 77
General Utility Co. 46, 47
Gill Mfg. Co. —
Globe Mfg. Co. 4
Graham Roller Bearing Co., The 72
Gray-Heath Co. 74
Greer College of Motoring. 74

H

Halladay Co., L. P. —
Haney & Co., J. H. 67
Hartson & Co., Inc., Thos. J. —
Harvey Spring & Forging Co. 53
Haywood Tire & Equipment Co. 78
Helser Special Tool Co. 72
Hinckley Machine Works. 75
Hobart Bros. 75
Hoffman Mfg. Co., Andrew. —
Holmes & Bros., Inc., Robert. 70
Howell Co., The W. H. 71

I

Inland Machine Works. Inside Front Cover

J

Jackson Compressor Co. 63
Jenkins Vulcan Spring Co. 35
Jewell Electrical Instrument Co. 71

K

Kennedy Car Liner & Bag Co. 75

L

Lawrence & Co., L. 74
Lourie Mfg. Co. 66

M

McDaniel Rubber Co., Leo. 73
Marvel Carburetor Co. 65
Marvel Machinery Co. 71
Mechanical Belt Co. —
Miami Trailer Co. —
Miller Rubber Co. 40-41
Monarch Machine Tool Co. —
Mutual Truck Co. 36-37

N

National Cash Register Co. 57
National Rubber Filler Co. 69
National Wire Wheel Works. 55
New Era Spring and Specialty Co. 75
New York Coll Co. —
No-Leak Piston Ring Co. 75
Norma Company of America, The 6

O

Owens, Frank Chas. 74

P

Paro, H. G., Co. 73
Phillips Engineering Co. 72
Pondelick Bros. 70

R

Reliance Co. 68
Romort Mfg. Co. 65

S

St. Paul Auto Cylinder Grinding Co. 74
Schrader's Son, Inc., A. 70
Shaler Co., C. A. —
..... Front Cover and 45
Standard Auto Salvage Co. 74
States Chemical Co. —
Stewart, F. W. —
Storm Mfg. Co. 59
Strickler, T. H. —
Sunderland Machinery & Supply Co. 74

T

Times Square Auto Supply Co. —
Trexler Co. —
Triangle Rubber Co. 71
Tubular Woven Fabric Co. 63

U

Universal Battery Co. —
Universal Mfg. & Sales Co. 72
U. S. Air Compressor Co. 66
Utilities Sales Corp. 46, 47

V

Vanderpool Vulcanizing Co. 72

W

Wagner Specialty Co. 75
Warshawsky & Co. 74
Waxit Mfg. Co. —
Webber & Co., P. H. 67
Weston Electrical Instrument Co. 49
Wisconsin Auto Top Co. —
Wood & Safford Machine Wks. —

Z

Zinke Co. 61 and 65

"Attracts Business for Blocks"



Use a Federal Electric Sign

The beautiful Federal Electric Sign catches the eye of passers-by and attracts attention of prospective customers for blocks in either direction, and from the cross streets as well. It shines in the daytime and sparkles at night—constantly boosting your business. It will pay for itself many times over.

You Have 12 Months to Pay

Erect a Federal porcelain-enameled steel sign. The first payment brings you this energetic business booster. Costs only a few cents a day for electricity—no other maintenance expense. An occasional washing keeps it bright and attractive. Let new customers know that you are ready for their patronage. Send the coupon today for complete information.

MAIL THIS COUPON TODAY

Federal Electric Company

Representing

Federal Sign System (Electric)
Lake and Desplaines Sts., Chicago

Please send full information on Enameled Steel Sign for my business and your 12-months-to-pay plan. No obligation.

NAME

ADDRESS

BUSINESS

(AG AD-8)

AUTOMOBILE SPRINGS
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago



HAYWOOD'S LATEST INVENTION

Here it is:

A new machine that will earn from \$100.00 to \$150.00 per week in any well-established tire repair shop. More than one year of constant experimenting and development work was required to complete it.

Statistics say there will be **One Billion Dollars'** worth of tires worn out this year. The insistent demand for re-treaded tires that would add 3,000 to 4,000 more miles of wear is growing. A new and better machine than had so far been produced was needed.

HAYWOOD'S
Silvr Lined
MOLD

meets the need. Made of white metal—die cast—absolutely free from blemishes and smooth as glass. It is truly a wonderful machine.

Old tires retreaded on this machine closely imitate the runner, **cord type**, and are smooth, classy, bright. All 4,000 owners of Haywood Tire Repair plants will **want** this new Haywood invention. Owners of other plants should have one.

**PAYS FOR ITSELF
IN A WEEK**

Will earn from \$100.00 to \$150.00 weekly. Are you an auto tire repairman? If you are not, why not enter this profitable business? Tire repairmen earn **\$2,500 to \$4,000 per year**. Many are doing better; some up to \$6,000 and \$7,000 per year. If you have a tire repair shop you need this Haywood Silvr-Lined Retread Mold. You should write us at once and get the details. It will pay for itself in a week. Every week thereafter you should make \$100.00 or more extra profit.

FREE BOOK

I have an interesting book to send you that tells about tire repairmen and the Haywood method. It tells about automobile tires—it gives inside facts that you should know about profits. When you write tell me if you have a tire repair shop, or, if you want facts about the tire repair business. Address

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., INDIANAPOLIS, IND.

WRITE ME!

I will tell you how to start in business as an expert tire repairman and earn \$2,500 to \$4,000 per year. Sounds too good to be true. But it is true, every word of it.

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., Indianapolis, Ind.
(Mark an X for interest in either or both subjects)

- ☐ Send facts about the Silvr-Lined Mold.
☐ Send facts about the Tire Repair business.

NAME _____

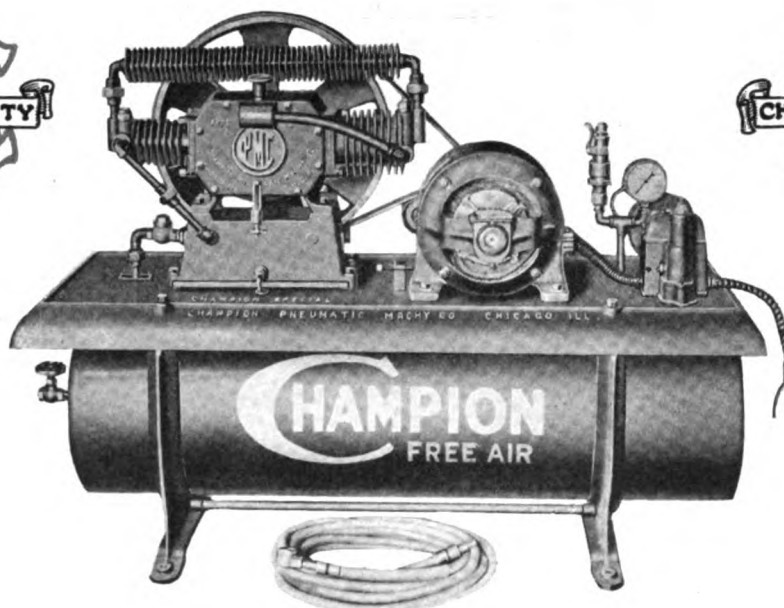
ADDRESS _____

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

**SILVR
LINED
RETREAD
MOLD**



N. E. Gibbard, Charlotte, Mich., owner of a Haywood plant, last year did a business of \$15,000. Charlotte is a town of 7,500 population.



THE CHAMPION SPECIAL AUTOMATIC AIR UNIT

SHIPPED ON APPROVAL

The well known

CHAMPION AIR COMPRESSOR

(The Fastest Two-Stage Air Compressor Ever Built)
(OF ITS SIZE)

READ THESE SPECIAL FEATURES

- 1 **Valves:** Mushroom Type, housed in bronze cages. Special arrangement for re-grinding.
- 2 **Crank-Shaft:** Drop forged, 1 1/4 inches in diameter.
- 3 **Connecting Rod Bearing:** 1 1/4 x 1 1/4 inches, bronze back, babbitt lined.
- 4 **Main Bearings:** Hess-Bright ball bearing.
- 5 **Connecting Rod:** I-beam type with inserted wrist pin bushing.
- 6 **Lubrication:** Automatic splash insures perfect lubrication.

That is exactly what we mean! We will ship you our latest design Champion Air Compressor on **30 Days' Approval**, because we have confidence in its performance, and know that after you have tried it, you will say, "The Champion is the air compressor we want."

Irrespective of whether you pay cash or buy on open account, when you order a Champion Air Compressor you have the privilege of testing it for 30 days in actual service. Then if it does not "prove up" we will take it back and refund you any money paid on account.

BUY ON EASY PAYMENTS! *If you wish*

You can buy the Champion on easy monthly payments if you desire. Simply make a reasonable first payment, and we will carry the balance to suit your convenience. No trouble to you and no red tape.

READ OUR BINDING GUARANTEE!

Our guarantee is broad and protecting to you. In part it says: "The Champion Pneumatic Machinery Co. hereby guarantees that the material used is of the best kind of quality suitable for the purpose. It guarantees the workmanship and finish to be of high class and that the apparatus will be capable of operating, as guaranteed. It also expressly agrees to replace free of charge, any part developing inherent defect under normal and proper use, within the period of TWO YEARS from date of sale, providing the purchaser gives the company immediate written notice of such defect and returns such defective material to factory, all transportation charges prepaid."

ILLUSTRATED BOOKLET SENT FREE

Simply Write or Mail Coupon

Just fill in the coupon with your name and address and mail, or write us a letter or postal, and we will send you our complete descriptive literature. Booklet explains how the Champion is made and operates. Every feature is illustrated. Remember you are under no obligation. Detach and send coupon today, because it's the air compressor that will please you.

**The Champion Pneumatic
Machinery Co.**

1402 S. Michigan Ave.

CHICAGO, ILL.

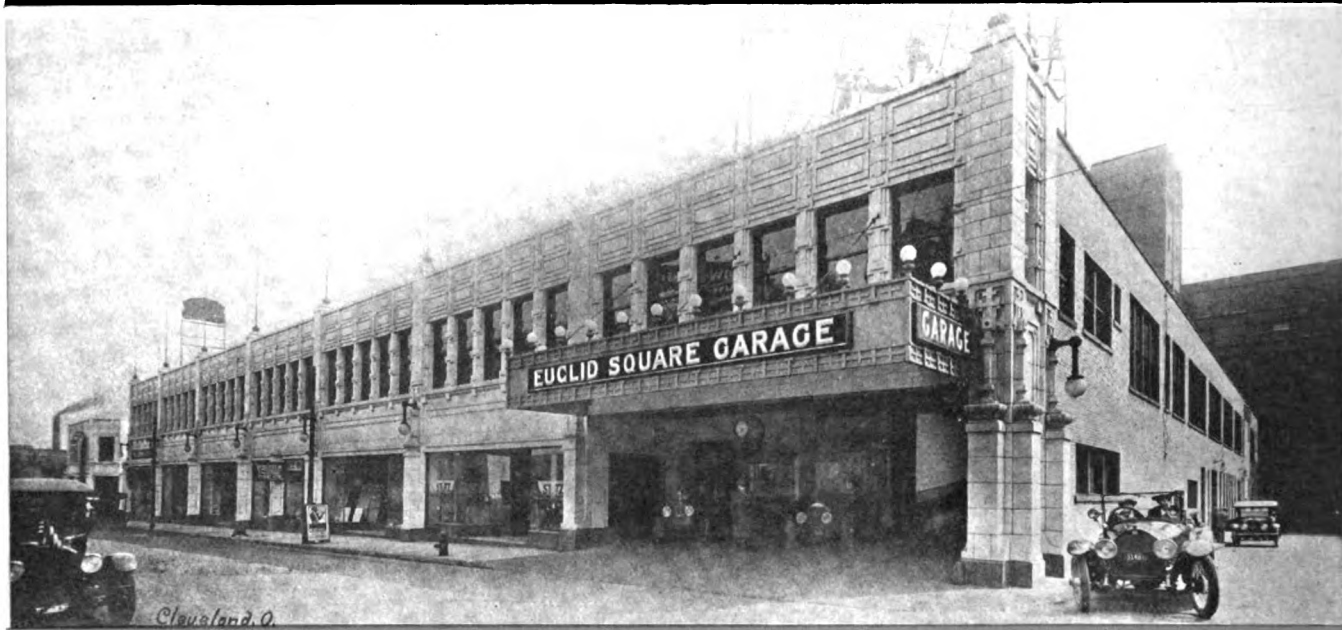
MAIL
COUPON

**The Champion
Pneumatic Machinery
Co., 1402 Michigan Avenue
Chicago, Illinois.**

Gentlemen:—Please send us your *free* descriptive booklet on the Champion Air Compressor.

Name _____

Address _____



It Took an Oplex Sign to Put the Finishing Touch on This Garage

This garage, located in Cleveland, is one of the finest in the country. They wanted a sign which would give it the last, finishing touch. An Oplex sign was chosen.

An Oplex sign will give the same distinctive look to your garage, your store front—raised snow-white letters standing out from a dark background, black-and-white contrast by day, greatest reading distance when the lights are on, a suggestion of quality all the time.

If you will tell us something about your needs we shall be glad to send you a sketch showing how your sign will look.

THE FLEXLUME SIGN CO. ELECTRICAL ADVERTISING
1334-38 Niagara Street, Buffalo, N.Y.

Pacific Coast Distributors:
Electric Products Corp., Los Angeles, Cal.

Canadian Distributors:
The Flexlume Sign Co., Ltd., Toronto, Can.

American Garage & Auto Dealer

Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

SEPTEMBER 1919

Vol. 10—No. 9
10 Cents the Copy
\$1.00 Per Year



Every Sale Brings — *Repeat Sale* — Profits

Show any customer how it works—right in your store—and the sale is made.

Then he becomes a steady customer of yours—for Patch-&-Heat units to use with this vulcanizer.

SHALER 5-Minute Vulcanizer

Dealers sold more than a million SHALER 5-Minute Vulcanizers last year—and over 11,557,000 Patch-&-Heat Units. This is repeat business—repeat profits—that comes to you **without effort**.

Get These Quick-Repeat Sales Profits—get the benefit of our big advertising campaign. Order from your jobber now or write us for full description and discount sheet.

C. A. Shaler Co., 358 Fourth Street, Waupun, Wis., U. S. A.
Oldest and Largest Manufacturers of Vulcanizers in the World



Unusual Advantages for Dealers

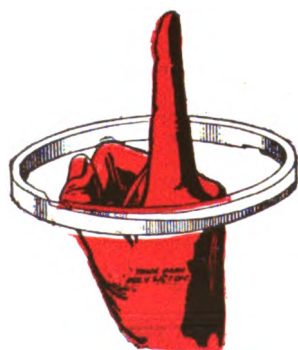
Inlands insure the high compression so necessary to get all the power out of the low test fuels of to-day. Worn or leaky piston rings are the cause of much trouble in automobile, truck, tractor and other types of gasoline engines. Such imperfect rings permit the compression and explosive force to escape past the pistons—only part of the fuel is burned—carbon deposits quickly form.

Inland Piston Rings insure full, deep-charging intake strokes and perfect compression—the fuel burns quick and clean—it all goes into power.

These money-making advantages of greater power insurance and operating economy of Inlands are not possible in any other ring. The patented Spiral Cut principle of construction cannot be duplicated. Inlands insure most power and liberal profits.

Inlands sell best because they save most. One-piece Spiral Cut—equal width and thickness all around—no gap. Made for every size and type of internal combustion engine. Cash in on these patented sales-winning advantages of Inlands. Inlands are sold by jobbers everywhere—ask yours—NOW.

Inland Machine Works, 1645 Locust Street, St. Louis, Mo.



INLAND

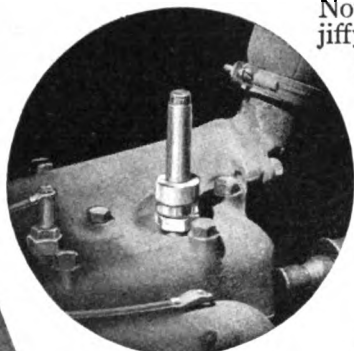
ONE-PIECE PISTON RING

Duplex ^{CYLINDER} Compression Tester

Tells which cylinder is weak—helps locate the cause of motor troubles

A car comes in for repairs. Lacks pep and power — what's wrong? Not necessary to take the car down to find the trouble. Do it in a jiffy, with the Duplex Cylinder Compression Tester.

It will tell you if the trouble is low compression, if the valves need grinding and which need it most; if the cylinder walls are worn, if piston rings or cylinders do not fit tight or if gaskets are leaking compression in one or more cylinders, etc. It's a regular X-Ray trouble detector. When repairs to cylinders or valves are done, it tells if the work has been done right. Simple and efficient. Nothing to wear out.



Fits

← SCHRADER or
TWITCHELL →
Tire Gauge

Used in a jiffy

Simply take out spark plug and insert the Duplex Tester (used) with Twitchell or Schrader Tire Gauge. Then turn motor by hand with good swinging stroke. The tire gauge will tell the exact compression. Do this with all cylinders and you know the condition of all of them.

Strongly built

Made from cold drawn steel—carefully machined—adapted to either $\frac{7}{8}$ or $\frac{1}{2}$ -in. plug hole (see the picture)—Schrader or Twitchell gauge can be inserted instantly. Beautifully finished with Parker rust-proof process—cannot rust.

Weak cylinder compression throws whole motor out of tune

Leaks in compression kill the power and efficiency of a motor — throw strain on whole car. When your car labors up easy hills, stalls in crowded traffic, has no pep in pick-up, eats up gasoline and oil, the Duplex Tester tells instantly what's wrong. Just grinding the valve of one cylinder shows weak compression will often make a "sick" motor run like a top.

Retail
Price

\$1⁰⁰

A special
washer
furnished
for use with
Twitchell
Tire Gauge

Big sale to Car Owners

Car owners are much interested in the Duplex Compression Tester. They buy it readily at \$1. Tells instantly when valves need regrinding, when new piston rings are needed or if gaskets are leaking compression. Here is one of the liveliest accessories that has been introduced for years. One of those much-needed things that *take hold* instantly.

Order today—satisfaction guaranteed or money refunded

The Duplex Cylinder Compression Tester is an even bigger necessity than the tire gauge. Simple and efficient. Nothing in it to wear out. Used with Schrader or Twitchell Tire Gauge. Send for one. Try it out. Use the coupon.

CASEY HUDSON CO., 375 E. Ohio St., Chicago

Use this to order one

CASEY HUDSON CO.,
375 E. Ohio St., Chicago.

Enclosed is 75 cents. Send me one Duplex Compression Tester with the understanding that satisfaction is guaranteed or money refunded.

Name _____

Address _____

Jobber's Name _____

Use this to order dozen

CASEY HUDSON CO.
375 E. Ohio St., Chicago.

Send us dozen Duplex Compression Testers, billing us at dealer's price, through jobber mentioned below.

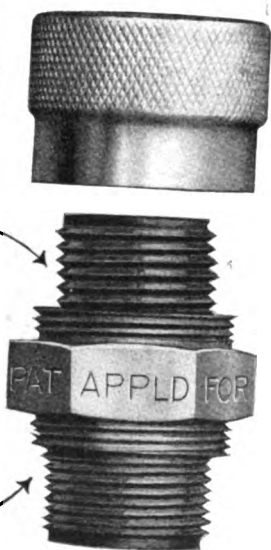
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Address _____

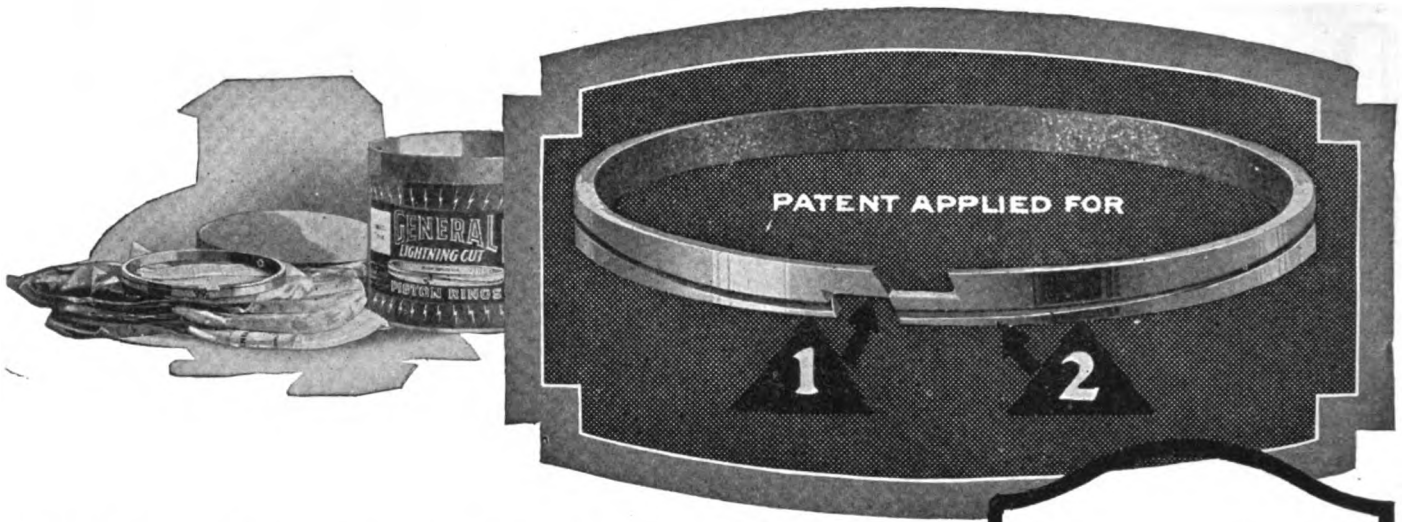
Jobber's Name _____

For cylinder
using $\frac{1}{2}$ -inch
spark plug

For cylinder
using $\frac{7}{8}$ -inch
spark plug



**Buy it for YOUR use
—sell it to your trade**



This Groove Gives Real "Stop" and "Go" Signals to Oil!

A GROOVE sweeps up and up around the Lightning Cut Ring. Oil gets just where lubrication experts say it should. It pulls the teeth of friction between piston ring and cylinder wall. On the down stroke, its straight edge effectually scrapes away all excess oil; returns it to the crank case.

With its combination of the old diagonal and step cuts, Lightning Cut Rings prove their superiority. Expansion may part the step cut but compression cannot pass. The broad edges of the diagonal cuts maintain a creeping, tenacious contact with their opposite walls and hold the power that moves the pistons.

GENERAL LIGHTNING CUT PISTON RINGS

From the individual casting is produced that fine grain, evenness of tensile strength and "springy" tension that distinguishes the Lightning Cut Ring from those sliced from pot castings. The scale left on the inside makes for uniform expansion.

Wear on cylinder walls caused by unequal ring pressure is conspicuous because of its absence. Lightning Cut Rings are of full concentric design.

Lightning Cut Rings are of one piece construction—unit expansion—unit strength and unit simplicity. They are made of finest gray iron, and are thoroughly tested and guaranteed.

With the extra power that Lightning Cut Rings afford the car owner he gets more mileage. With

less oil he gets less carbon. With less friction, less wear. Be ready to sell or equip him.

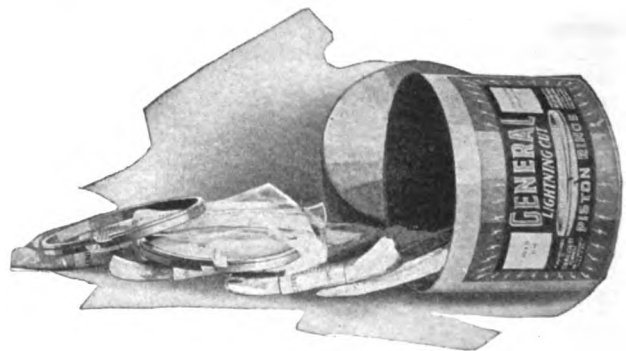
Made in all sizes. Packed in oil proof envelopes. Neatly boxed. One dozen to the carton. Cartons are attractively labelled and make a handsome display.

Our new selling plan revolutionizes the marketing of piston rings. Fall in line with other progressives and write for details. It's a money maker.

1. The Lightning Cut.
2. Oil Distributing Groove.

Left: Shows shape of oil groove. Note scraping edge.

Bottom: Shows upward course of oil groove.



UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

Factory 1324 Ogden St. Philadelphia - Office 809 New Stock Exchange Bldg., Philadelphia

Utilities that Sell Because They Serve

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

White Stripe is made to make good

No expense is spared in making WHITE STRIPE.

The finest quality cotton is woven by specially constructed looms into a new and original weave designed purposely for friction wear.

This special weave is treated—down to the last strand—by a process which protects the fabric from friction wear, hot oil, and the residue from unburned fuel.

No other fabric costs so much to make as WHITE STRIPE. From start to finish, it is made for the Ford Transmission. It is the only lining so made. Ours are the only looms that weave the WHITE STRIPE fabric. No other lining has a treatment like WHITE STRIPE.

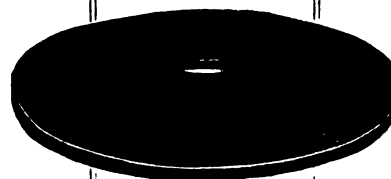
WHITE STRIPE wins and holds its popularity by *making good*—by giving the Ford owner more value for his money than he gets in any other fabric lining.

You can easily identify WHITE STRIPE—every inch bears the famous WHITE STRIPE Trade Mark. Insist on WHITE STRIPE and get your money's worth.



White Stripe Lining

Is sold in sets and rolls. \$2.00 per set; Rockies West \$2.25; In Canada \$3.00; In Rolls 32c per foot; Rockies West 35c; In Canada 40c per foot.



White Stripe Lining is Woven-Treated and Packed by the

Advance Automobile Accessories Corporation

Dept. J-7, 56 East Randolph Street, Chicago, Illinois

"NORMA" PRECISION BALL BEARINGS

(PATENTED)



Whether a machine be purchased for pleasure or for profit, it is bought with the idea of securing service from it—a service representing earnings on its first or investment cost. When that machine is laid up for repairs or replacements, it is an idle investment against which actual expense is being charged, instead of earnings credited.

Failure of a bearing in a magneto or lighting generator destroys the earning power of the machine that carries it. To guard against this, "NORMA" Precision Bearings have been adopted as standards by the builders of this electrical equipment, having proved by service tests the security which "NORMA" gives.

Be SURE. See that your electrical apparatus is "NORMA" equipped.



THE NORMA COMPANY OF AMERICA
1790 BROADWAY NEW YORK

Ball, Roller, Thrust and Combination Bearings

American Garage & Auto Dealer

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|--|----|
| Finance Time Sales Locally Whenever It Is Possible | 9 |
| National Anti-Theft Bill Needs Support from Trade Dealers Must Help Increase Truck Transportation Facilities | 9 |
| Make Plans to Sell Farm Electric Plants | 11 |

GENERAL

| | |
|--|-------|
| How Dealers Can Get Good Publicity, by C. M. Adams | 12 |
| Anti-Theft Bill Offered to Congress | 13 |
| Uses Vacant Lot for Parking Space, by Felix J. Kock | 14-15 |
| Use of Lathe Tools for Garagemen, by J. N. Bagley | 16-17 |
| Good Roads and Trucks Aid Farmers | 18 |
| Care Needed When Buying Accessories, by J. E. Bullard | 19-20 |
| New Zealand Beckons Tourist | 21 |
| Advertising Cuts Must Be Cared For, by Lester G. Herbert | 22-23 |
| Good Window Displays Help Sales, by Arthur C. Brown | 23-24 |
| The Law on Over-Exertion Injuries, by Chelsa C. Sherlock | 24-26 |
| Getting Big Profit from Used Cars, by Craig Hamilton | 26-27 |
| Trailers Shown in Motor Truck Tour, by H. W. Perry | 27 |
| Motor Truck Convoy Is Led by Band | 28 |
| Tentative Chart of Accounts Set Up, by J. Newton Boddy | 29-30 |
| Signs Guide Tourists' Cars to Doors, by John Grant | 31 |
| Amendment to Car Seizure Bill | 34 |
| How a County Got Behind a Truck Manufactory, by R. R. Shuman | 44 |

DEPARTMENTS

| | |
|---|-------|
| Welding, Cutting, and Brazing Practice, by David Baxter | 32-33 |
| Practical Hints for Shop Mechanics, by E. C. Pohlmann | 36-38 |
| How to Make the Shop Profitable, by E. B. Hinrichsen | 42 |
| Readers' Questions and Answers, by E. C. Pohlmann | 50-52 |
| Facts and Ideas for the Tire Dealer | 54 |
| Accessories—They Bring in Money | 56 |
| Garage Equipment for Better Efficiency | 58 |
| From the Truck and Trailer Field | 60-62 |
| News of Manufacturers and Jobbers | 64 |
| Buyers' Reference | 76 |
| Index to Advertisers | 77 |

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116 S. Michigan Avenue, Chicago, Ill.

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H. D. FARGO, *Vice President* E. C. HOLE, *Vice President*
E. T. CLISSOLD, *Vice President* S. R. EDWARDS, *Secretary*

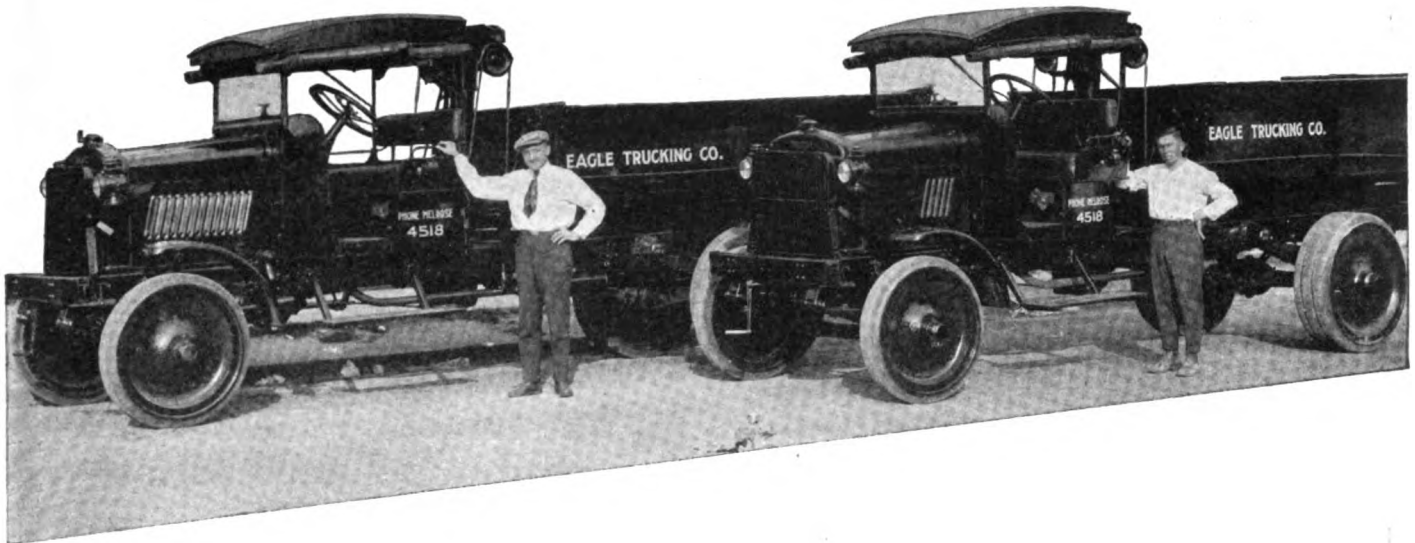
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DENBY

MOTOR TRUCKS



THE big Denby 5-tonners are very popular with contractors because they can handle work unaided that is beyond the ability of the ordinary truck.

Carrying capacity loads, they easily pull out of excavations under their own power when other trucks must be helped.

This ability to meet the hardest work successfully is typical of the Denby line. Each model—and there is one for every trucking need—is built to meet any service that a truck of its capacity may have to.

Back of this greater performance ability is a fuel economy that is unusually low. The result is a hauling cost that increases profits.

DEALERS!

There are big opportunities in merchandising Denby trucks; maybe there's some open territory in your section. A letter to the factory will post you.

DENBY MOTOR TRUCK COMPANY
DETROIT U. S. A.



The CLARK HARDWARE COMPANY of Anderson, Ind., are not only live dealers, but typical TIRE-DOH dealers, who believe in selling profitable accessories

In a recent letter they state—"We have been selling TIRE-DOH for about three years and will say it is the very best auto tire and tube repair outfit we have ever seen. It will repair anything that is rubber. We have a very good trade built up on TIRE-DOH; our sales average about three dozen Junior (50c) size a week. If a fellow had a number of items that sold like TIRE-DOH he would soon be on Easy Street.

"The Atlas Auto Supply Co. are not a bit backward about sending out advertising matter (for window and showcase display) and of course this helps both of us."

**The Genuine TIRE-DOH Outfit
Consists of One Can TIRE-DOH
and One Can TIRE-DOH Cement**



**What Clark Hardware is doing
you can do**

TIRE-DOH not only sells readily—but is a sure and consistent "repeater." The car owner who once uses this tire repair outfit never bothers with any other. There is a big demand for TIRE-DOH and we help you to take full advantage of it.

**Become a TIRE-DOH Dealer
It will be the best move you ever made**

TIRE-DOH'S rapid sales afford dealers a quick "turnover" as well as a liberal margin of profit. Our selling plan is a demonstrated success.

Write today for full particulars

Atlas Auto Supply Company
680 W. Austin Avenue Chicago, Ill.

American Garage & Auto Dealer

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

Vol. X. No. 9

CHICAGO

September, 1919

Finance Time Sales Locally Whenever It Is Possible.

Every passenger car or motor truck dealer who sells vehicles for which he does not collect the entire selling price upon delivery should make every effort to arrange that the financing in connection with such sales be done in his own city. Whenever a dealer arranges for the financing of part payment sales to be done by one of the big Chicago or New York corporations that make a specialty of this business, he voluntarily sends out of his own community some banking profits that ought to be earned in the city or town where his business is located.

In the earlier days of the retail automotive business there was not much choice about this, as a rule, because the local bankers were too often inclined to frown upon installment sales of passenger cars. Before it was realized that almost all passenger automobiles are very largely used for business purposes a good portion of the time, bankers generally regarded motor cars as luxuries and the buying of them on the partial payment plan as extravagance. This was the principal reason why so many of them refused to discount the notes which automobile dealers took as part payment for cars, with the result that the financing companies especially organized for the purpose, reaped the benefit of most of the business.

But at the present time, however, many bankers are both willing and anxious to do their share toward the general upbuilding of their own home towns and localities that will follow

the handling of what is called "automobile dealers' paper." In the majority of cases all that a dealer will have to do in order to have his own bank finance his partial payment sales will be for him to explain his needs in this line. In the case of part payment sales of motor trucks, dealers will find that their own bankers are almost always willing to handle the financing part of the transaction. They know, or will quickly realize when told, the need that exists for more of the improved merchandise transportation facilities by each additional truck that is put into service. When financing is done locally the fees, interest charges, and at least part of the required insurance premiums, go to increase the business ammunition of the dealer's own sales territory.

National Anti-Theft Bill Needs Support from Trade.

Every person interested in the manufacture, sale and use of motor vehicles should help in every way possible the movement now under way to put an end to the stealing of passenger cars and motor trucks. The legislatures of several states have passed or are now considering measures designed to discourage motor vehicle stealing but each of these differs in some respect from the others.

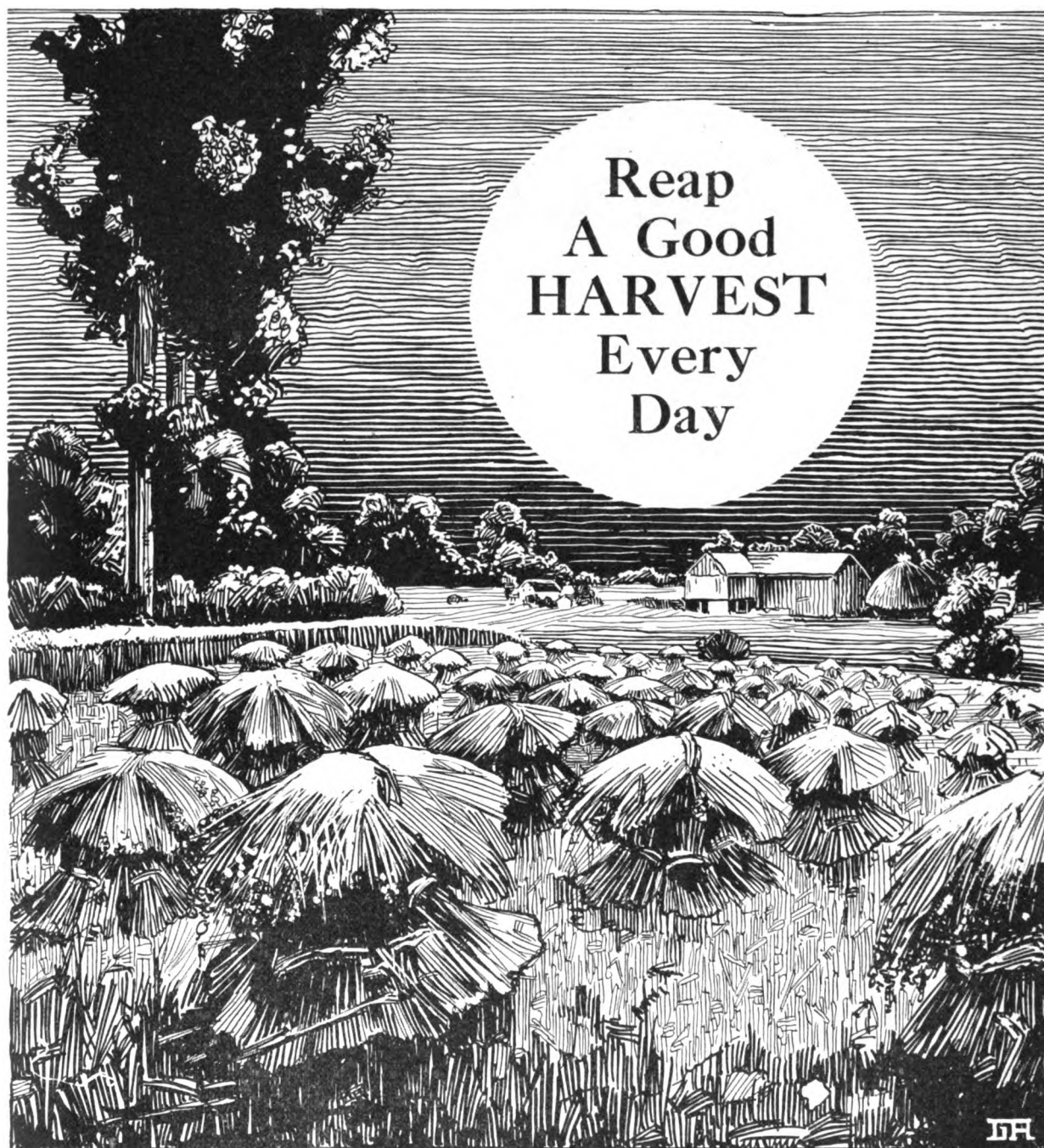
Beyond any question one of the surest ways of lessening this evil would be the enactment of a federal law providing severe penalties for thefts of motor vehicles. The question is one that can well be put under federal control or supervision because

so many of the cars and trucks that are stolen are immediately driven into adjoining states, so that the motor vehicle stealing problem is of serious importance to the whole country and not merely one for the several states to deal with. There ought to be laws in each state on the subject, but there can be no effective method devised of dealing with the evil until a federal measure, carrying severe penalties, has been adopted and put into effect.

The directors of the National Automobile Dealers' Association have had this problem under discussion for some time. The dealers' body has had a bill drawn that the N. A. D. A. officials believe will greatly lessen the number of motor vehicle thefts, and this measure has been introduced in Congress by Representatives Dyer and Newton. Everyone who has any connection with the manufacture, sale and use of motor vehicles should write to their own congressman asking him to support this bill.

Dealers Must Help Increase Truck Transportation Facilities.

Whether or not there is a strike of railroad men during the coming winter, it is quite certain that the railroads will have difficulty in furnishing the transportation for all of the various kinds of freight that will be offered to them. Predictions have been made that there will be a big shortage of freight cars during the winter and whenever this happens it generally makes a good deal of trouble for the shippers who send less than carload lots. This class of shippers can be greatly helped by rural



¶ The shrewd and enterprising automotive merchant, if he would succeed as he should these days, must so plan his commercial activities that he reaps his harvest every business day of the year—not simply once in a season as is the custom of the agricultural business men who must wait for their crops to ripen.

¶ The harvest of profits from the growth of accessory sales is a crop that can be gathered every day if automotive tradesmen are alive to their opportunities in this line. Owners of passenger cars, motor trucks, tractors, farm electric systems, and trailers need accessories every day and will buy them from the man who keeps a proper stock on hand.

¶ Careful plans must be made now to keep repair shop mechanics busy during the cold months doing work that otherwise would not come in until next Spring when the shop would be rushed beyond its normal capacity. This will assure a constant harvest of profits during a period that too often is not productive because the ground has not been cultivated by solicitation months in advance.

motor express lines, when there are any of these lines serving their communities.

If there is anything like the freight congestion on the railroads this winter that is expected, a good many of the cities of the country will have great trouble getting farm products unless the service of the railroads is supplemented by motor truck transportation lines. Automotive dealers who have not already taken up the subject of organizing or helping to organize rural motor express lines for their localities ought to look into this matter at once. The various trade associations are doing everything possible to help this movement and have much valuable information which they gladly furnish to whoever asks for it.

The need that now exists and which is constantly growing for freight transportation affords an opportunity for a great many dealers in small places to help increase the motor truck transportation facilities of their towns. As the increasing production of passenger cars begins to catch up with the demand during the coming months there will be more used cars put on the market. In a good many cases these vehicles have had very rough usage during the last few years, but their power plants will be in such condition that they can be fixed up at a nominal expense. Automotive dealers who take these power plants and combine them with one of the various truck attachments, will thus be able to produce an efficient one-ton or two-ton motor truck at a comparatively small outlay of money.

If passenger car dealers and others will devote some of their time and money to turning old passenger cars into new trucks during the cold weather months they will be putting the used cars to the best possible use. When reducing the number of second-hand passenger cars on their local markets and increasing the motor truck transportation facilities, automotive merchants will not only be

Make Plans Now to Sell Farm Electric Plants.

September is a very good month for automotive dealers who have not already done so to make plans to sell farm electric light and power plants in their territories. Never before in the history of this country have the farmers as a class and as individuals been as prosperous as they are now. Thousands of the men who have ben-

efited from the high prices of food products are only waiting for some energetic dealer to come along and tell them about the advantages of farm electric plants before placing their orders.

If a dealer will obtain the agency for a reliable farm electric plant and begin his missionary work among the farmers in his sales territory at once, he will be building up a trade that will bring profits during the fall and winter when his establishment will not be as busy selling vehicles or giving service for them as at present. While the advantage of having a comparatively inexpensive source of electric illumination is one of the strongest arguments in favor of the farm electric plant, automotive dealers should

Need of Thrift Emphasized

The people in many parts of the United States are virtually in league with the profiteers, according to William Mather Lewis, director of the savings division of the Treasury Department who recently returned to Washington after visiting the various Federal Reserve districts.

"A veritable orgy of extravagant buying is going on," he said. "The reaction from the careful use of money during war time is widespread and disturbing. Retailers are securing goods from jobbers without arguing about prices, if they can only be assured of immediate delivery. They know their customers will scramble for the goods, regardless of cost. Thus, with an abnormal demand and a limited output, nothing else can be expected than high prices. It is a natural, though deplorable, consequence that profiteers abound.

"The people must return to the policy of careful buying and regular saving if they wish to help the situation. The Treasury Department, in order to combat this artificial situation, is intensifying and speeding up its thrift campaign. Statements on the principles of finance and the laws of investment and budgetry are being brought to workers in factories, to farmers, to business and professional men, and members of women's organizations by means of printed publicity and the spoken word. A nation-wide attack upon swindlers who are persuading people to dispose of their Liberty Bonds and War Savings Stamps is also being inaugurated.

"Throughout New England, savings and thrift organizations already are exerting their combined efforts to combat increased cost of the necessities of life. Saving directors and hundreds of officers of savings societies are taking the lead in disseminating information concerning fair prices.

"In their communities they are aiding the determination and publication of fair prices and in curbing unjust profits. They are following the plan of a campaign recently outlined by Governor W. P. C. Harding of the Federal Reserve Board, to promote regular and efficient work, to increase production and insure reasonable economies, to devote that production to necessities rather than extravagances or luxuries.

"Steps are being taken to insure similar efforts throughout the other Federal Reserve Districts."

smoothing the way for sales of new passenger cars but also be doing a real public service to their own communities.

Not only will the outlay of money on this work be returned, together with a comfortable profit, but best of all, it is an aid to a re-sale, which in turn has been the cause of a new sale. There is the added feature that such work aids in keeping the working organization intact the year through.

also emphasize the fact that these plants provide inexpensive power which will help to do much of the work on a farm rapidly and efficiently.

There is not a farmer living who does not have constant use for power-driven shop tools, to say nothing of power-driven household utilities, and, here again, is the best selling argument the dealer can find—an argument convincing in itself but better when backed up by demonstration.

How Dealers Can Get Good Publicity

Former Newspaper Editor Explains in Detail the Methods to Be Followed by Automotive Merchants Who Realize the Value of Local Publicity and Desire to Use the Proper Means to Obtain This Great Aid to Business

By C. M. Adams

The telephone jangled. The editor, trying frantically to correct galley proofs with one hand and write heads with the other, jerked the receiver from the hook. "Chronicle office!" he bawled into the transmitter.

"This is the Progress Motor Co., Brown speaking," came a leisurely voice over the wire. "I thought you'd like to have an item that will be of interest to your readers. We just sold one of our new Ever-ready light sixes to Mr. John Smith, and if you could give—"

"Sorry. We're short of space," the editor snapped and banged the receiver back on the hook just as a printer stuck his head into the office.

"Got something about two lines or so?" he inquired. "There's a hole at the bottom of the local items' column."

The editor glared at him and the litter of papers scattered over his desk, then turning, he burrowed into the pile and came up with a business letter-head on which was neatly typed: "Mr. John Jones of Popular street, has purchased a new touring car."

"Here! Use this," he ordered, and flipped the paper across to the waiting printer; and when the day's issue of the Chronicle appeared an hour and a half later the fact that Mr. John Jones had purchased a new touring car was duly recorded while there was not a word concerning the sale of an Ever-ready light six by the Progress Motor Car Co. to Mr. John Smith.

The letter-head on which the item concerning John Jones had been neatly typed bore the name of the Advance Motor Co. The Chronicle editor knew that. He knew also that the item had been written and sent to him for the sole purpose of advertising without cost the Advance Motor Co. and its cars; exactly as the Progress Motor Car Co. had sought to do by means of its telephoned item. Yet he flatly, not to say curtly, refused the offering of

the Progress Co. and accepted the offering of the Advance Co. for two reasons which should afford an accurate guide for automotive merchants seeking to obtain what seemingly everyone in the world desires next to life itself—namely, free publicity.

First of all, the item of the Progress Co. was advertising, while that of the Advance Co. was news.

I know the proposition of just what is news and what is advertising can be debated and debated without obtaining any definite results in the way of a clear or definite idea which can be expressed in an equation like a motor rating. But, after spending two years separating just such items into their respective classes, I say the Progress item is advertising and the Advance item is news.

The Progress item stated a fact primarily and obviously of business importance to the company itself, while the Advance item mentioned no company, no car, and stated a fact seemingly of importance only to a private citizen quite irrespective of any business relationship.

Second, the Advance item was sent to the editor's desk neatly typewritten while the Progress item was merely telephoned in.

In the rush which almost invariably precedes press time the editor had to answer the telephone, and, if he had decided to use the material offered him, must write it himself. All he had to do with the Advance item was to read it over and hand it to the printer.

So, from these two reasons can be drawn a rule for the preparation of acceptable press notices. Put them in the form of news and write them out—preferably on a typewriter.

"But what if you do get a notice printed just saying John Jones has bought a new car? What good will that do you as advertising, even if

it is free?" some automotive man will object at once. "You don't say who it is he bought the car from or what kind of a car he bought."

This is an altogether natural query. But, by way of explanation, what is the first thing a friend of Jones will want to know when he reads such an item in the newspaper? In nine cases out of ten he will want to know what kind of a car Jones bought and will persist in asking people who ought to know until he finds out. I know of one man who asked for six weeks until he found out what kind of a car an acquaintance bought: conditions being such that he could not find out directly from the purchaser.

So, after all, the purpose of the press notice is attained and at the same time it keeps within the strict bounds set for news by editors.

But the press notice concerning car or truck sales is not the only means of free publicity available to the automotive merchant and those who are not car dealers at all have quite as good an opportunity for desirable mention in newspaper columns.

Repair, storage and livery garages are almost without exception places where much news of local interest can be gathered or verified: for to these establishments come first-hand facts concerning accidents, the passing of tourist parties, the departure or arrival of local people, and many other occurrences. These can be telephoned or sent in written form to the newspapers; or if inquiries are made by reporters of the newspapers, the information asked for can be courteously and completely supplied. In this way a friendly co-operation can be built up between garage and newspapers.

I know of several newspapers that make a practice of mentioning the name of the funeral director who sends in the news of a death in their

territory. It should not be difficult to work out the same arrangement with respect to news picked up in a garage.

What must be kept in mind first and last is the fact that free publicity can be had, all statements to the contrary notwithstanding. Naturally the big city dailies offer the poorest field for such ventures, because they give little space to the small items which car sales and such automotive news generally supply. But they should not be considered as hopeless by any means.

The best field is perhaps the small-

town daily or weekly. These papers make a specialty of small items with local interest, and in this connection it must always be remembered that the more local names an item contains, the better local news it is. To the editor of a small-town paper the news that John Smith has broken his finger cranking his flivver is of much more importance than a 2,000-word Associated Press story about the peace conference, and this should never be overlooked.

It is necessary only to present the

matter in the proper form and in the proper attitude. Obviously it would be utterly foolish for an automotive merchant who had just had an unpleasant disagreement with a newspaper over an advertising contract, to offer it press notices of the kind supplied by the Progress Motor Co. in the foregoing. But if he has the energy and the patience to offer persistently to newspapers the bits of news which have no value to him, he can indeed receive something for nothing in the form of valuable press publicity.

Anti-Theft Bill Offered to Congress

Penalty of Ten Years Imprisonment for Stealing Motor Vehicles Is Named in Federal Measure Introduced in House at Washington by Representatives Dyer and Newton on Behalf of the National Automobile Dealers' Association

Ten years' imprisonment for the theft of an automobile is the "law with teeth in it" offered to Congress by Representative L. C. Dyer and Representative C. A. Newton of St. Louis on behalf of the National Automobile Dealers' Association to check automobile thefts. The measure to be known as the Motor Vehicle Theft Act is before the sub-committee of the House Judiciary Committee of which Mr. Dyer is the chairman. It is a combination of Congressman Dyer's original bill to check these thefts and the N. A. D. A. measure, Mr. Dyer's original measure was not broad enough to cover the situation and he gladly offered to take the N. A. D. A. measure as an amendment.

The Dyer bill as it will come from the committee is substantially as follows:

"Be it enacted by the Senate and the House of Representatives of the United States in Congress assembled:

"Section 1.—The term 'interstate commerce' as used in this act shall include transportation from any state or territory or the District of Columbia to any other state or territory or

the District of Columbia or to any foreign country.

"Section 2.—Who ever shall in any state, territory, or the District of Columbia steal or unlawfully take, carry away or conceal, with intent to convert to his own use, any automobile, automobile truck or any other motor vehicle, or shall buy or receive or have in his possession any such automobile, automobile truck or any other motor vehicle, knowing the same to

have been stolen, or shall thereafter, in any other manner or means transport such automobile, automobile truck, or other motor vehicle in interstate commerce, to any other state, territory, or the District of Columbia, or to a foreign country, shall be deemed guilty of a felony and upon conviction thereof shall be punished by imprisonment for not more than ten years.

"Section 3.—Nothing in this act shall be held to take away or impair the jurisdiction of the courts of the several states under the laws thereof and a judgment of conviction or acquittal on the merits under the laws of any state shall be a bar to a prosecution hereunder for the same act or acts."

The technical point around which the whole question devolved was whether an automobile driven from one state into another is a part of "interstate commerce," and hence within the constitutional power of Congress to regulate.

So far there never has been an inkling of an opinion by the United States Supreme Court as to whether an automobile so used is really interstate commerce.



President F. W. A. Vesper of the National Automobile Dealers' Association is a Very Strong Booster of the Bill.

The decisions relied upon to sustain the constitutionality of the Motor Vehicle Theft Act all relate to different subjects. One of these is the decision in the now famous Minnesota Rate Case. In this decision the Supreme Court says that "The power of Congress to regulate commerce among the several states is supreme and plenary" and "... extends to every part of interstate commerce and to every instrumentality or agency by which it is carried on."

In *Covington, etc., Bridge Co. vs. Ky.* (154 U. S. 218) the rule is put in defining "commerce." "With reference to the second question an attempt is made to distinguish a bridge from a ferry boat, and to argue that while the latter is an instrument of interstate commerce the former is not. Both are, however, vehicles of such commerce. Commerce was defined in *Gibbons vs. Ogden*, (the famous Robert Fulton Steamboat controversy) to be 'intercourse' and the

thousands of people who daily pass and repass over this bridge may be as truly said to be engaged in interstate commerce as if they were shipping cargoes of merchandise from New York to Liverpool."

"No attempt has been made," according to C. A. Vane, attorney of the National Automobile Dealers' Association, "to take up the time of the Federal courts with the 'joy rider.' It is extremely doubtful," he declares, "if the Federal courts would pay any attention to such a provision if it were in such a bill, so in order to safeguard the real point at interest, it has been considered safer to eliminate this feature altogether."

"We have the assurance from Representatives Newton and Dyer that they will give this bill their personal attention in Congress. Representative Newton believes it possible that it may be enacted by December."

"The bill was drawn and the decisions to sustain it briefed by William

Baer, assistant circuit attorney of St. Louis and a splendid criminal and constitutional lawyer. It has the endorsement of the St. Louis Chamber of Commerce as well as the National Automobile Dealers' Association and these two organizations will solicit the support of every commercial organization, every automobile trade organization, the newspapers, trade papers, and automobile insurance companies, for its enactment.

"The bill was very favorably received upon its introduction. Representative Newton's testimony before the Judiciary Committee that \$27,000,000 worth of automobiles were stolen in 21 states alone in the United States in 1918 amazed the committee members."

"President Vesper and Business Manager Moock of the dealer organization regard the motor vehicle theft act to be without doubt the greatest single piece of constructive legislation ever offered the automobile trade."

Uses Vacant Lot for Parking Space

Enterprising Cincinnati Man Leases Land in Center of City Upon Which Buildings Are Yet to be Erected—Derives Much Profit from Car Owners Who Wish to Leave Their Cars in a Secure Storage Place for a Small Fee

Felix J. Koch

In the heart of the big American midwest, Cincinnati, an enterprising citizen has discovered that there are better uses for vacant city lots, sites of buildings lately torn down and on which construction of the new edifices has not yet begun, than letting them lie idle. In short, he would convert these to private open-air garages, or parking places for automobiles.

Profit in it?

Well, it really does not take very, very high-priced labor to clean a vacant lot and rake it over; nor to erect a neat, wire lattice fence. So, too, with a checking-system by which the checks show the returns there must be, it does not need the highest-priced attendant to operate the establishment.

As a result of this plan in Cincinnati, Captain Maycox has secured leases on two, and perhaps more, of the most desirable pieces of vacant

property in the very heart of the business section.

About this, at intervals, inexpensive posts were erected; between the posts went cross-timbers; over these the wire lattice was fastened. Then the lot was swept clean; drives were laid out; a little house set up in a corner for the attendant; with these changes, the best part of the improvements were made.

Then, second thought, while those motor vehicles were here, their owners busy elsewhere, why not have minor repairs attended to where there was need? Why not put on new tires and the like? Therefore, over the gate of the Auto Park & Annex Co. parking station a neat sign announced shortly that tires were on sale there and that tire repairs were made as well.

The charge was only 25 cents per

day for this safe, clean storage. Cincinnati, which had tired of having automobiles stolen from free storage places, thought it good. Business grew and ere long a lot across the street was added.

So good was business there that a great oil company arranged to erect one of its familiar filling stations at a corner of the site. To have oil and gasoline, and so on, put in while one was away would be convenient and so bring added patrons to the parking space. Conversely, not to lose time for the buying and filling, would sell the oil people no end of gasoline and oil.

Immaterial of whether the principal attraction is parking space, the novel storage venture has paid again and again.

The larger lot alone holds 300 automobiles and rare is the time that at

least 75 cars are not gathered there. The gates open at 7 o'clock in the morning and are open nominally until 7 P. M. After that there is arrangement with the attendant at the filling station so that he takes care of all cars outside of those hours.

From 7 in the morning on, however, there is a steady stream of automobiles. Men who come down to open the stores; foremen, etc., who must be at the factories early, form the first lot. Close on their heels come the storekeepers themselves. After these come office men, bankers, lawyers, etc.

Then, without a moment's lull, shoppers—women—begin coming down. They continue to pour in until midday, and on until 3 of the afternoon. Then the exodus begins. It keeps up until 7 in the evening.

Now they are considering keeping open to accommodate the theatre-goers and other evening trade. So, too, they must accommodate folks who come in from out of town to see the ball game and who do not care to use their cars after supper until really time to leave.

The charge for storing the car all day, or any fraction thereof, is a quarter; and, all considered, that is cheap enough. Gasolene and oil are put in the car while there at the usual prices. Repairs, too, are reasonable in price when made.

As a result, both the park owner and the oil concern subletting are satisfied beyond measure.

Nor is the project at all a bad one for the owners of the ground. In this case the new Masonic Temple, Cincinnati men

are projecting is to rise on the site, but the parking space brings revenue from the property in the meanwhile. Where no buyer has been found, parks like these bring

other uses, thereby, obviously, assisting the ground's agents to the very, very best advantage in the end.

In Cincinnati attendants at the filling stations of the sort mentioned are largely retired city firemen. These men draw a fireman's pension and, with the pay as station keepers and the tips from parkers, as well as extra pay for looking to machines left after seven of the evening, the men do very well. The position is one coveted by most of these veteran fire-fighters and as a result attendants of this sort are never difficult to obtain.

Two Buildings for National Automobile Show.

For the first time in its history the automobile industry will enjoy, this winter, ample housing facilities for the annual national shows. This condition has been brought about by the addition to the buildings heretofore occupied by two of the largest structures of their kind in the world. It will therefore be possible to hold, for the first time, passenger and commercial departments of the shows the same week, both at Chicago and New York. Grand Central Palace will be available for the passenger car section of the New York show.

Several important facts indicate that the coming exhibitions will be the greatest in the history of the industry.

There will be no important changes in the plans for the passenger car shows, except that all of the exhibits will be confined strictly to passenger cars and their accessories.

The plan of using a vacant lot as a site for an open-air parking space described on these pages is one that can be adapted to good advantage in cities and towns, both great and small. At the present time the idea is one that will be found most practical in cities and towns where there is a good deal of passenger car traffic in a business district. But with the rapid growth all over the country of local ordinances that limit the length of time during which a car may be left unattended in a street, some such plan as the one followed by Captain Maycox in Cincinnati can be carried out to good advantage.

The idea might very easily be used by some owner of a garage whose building does not have storage capacity for a great number of cars, because the name of his own regular establishment could be used with the addition of the word "Annex" as the title for the open-air parking space.

The expense of opening and conducting one of these open-air parking spaces is comparatively small and the returns should be very satisfactory. Even in cities and towns where there is no ordinance prohibiting car owners from leaving their vehicles alone in the streets, open-air parking spaces should prove profitable undertakings because so many people would gladly pay 25 cents to leave their car in such a place and be entirely free of the fear that the vehicle might be stolen while they were away.

thousands of people to the site, giving them the habit of using the streets nearby, and thereby increasing its value. Among the many, too, there may be one so struck with the site as to arrange to buy it and convert it to



The Vacant Lot in the Heart of Cincinnati Used as a Parking Space.

Use of Lathe Tools for Garagemen

In Operation of Lathe Nothing Is of More Importance to the Workman Than to Know What Kind of Tool to Use and Its Proper Position in the Holder to Correspond to the Kind and Hardness of the Metal

By J. N. Bagley

The importance of lathe work is continually growing in the repair shop and many shops are installing various sized lathes. However, the size best adapted to general shop use seems to be the 13" swing over carriage, and bed length of 5 to 8 feet. The more complete the equipment of chucks, tools, etc., the more varieties of work can be handled on the lathe. For instance, if an axle for a car is to be made from the roll stock it will, besides the cutting, require a keyway cutting device or a milling attachment as we term it. This device is inexpensive, depending on the size, of course, but only a few jobs are necessary to pay for it.

There is not a tool that can be installed in the shop that will pay better returns for

temper is drawn to the desired degree of hardness.

At this time we will consider only such tools as are used with the slide rest, as the hand tool is a thing of the past except for some special job that a mechanic may have.

The shape of a tool will depend on the work to be done, the kind of metal to be cut, and whether or not the cut is to be a roughing or a finished cut. Then again the degree of hardness of the metal to be cut must be taken into consideration, and to judge this correctly we must know about how far from the tool holder the cutting edge of the tool will extend when locked in the tool post for cutting

threading tool for cutting threads, and this may be either internal or external as the case may be.

Referring again to the diamond point shown in Fig. 1, we will find that the cutting edge should not be on a straight line with the body of the tool except for some special metals, but instead should have a slant as shown by the dotted line. A cutting edge with this slope, as we will call it, will take a larger cut with less power besides producing a smoother surface.

Referring to Fig. 2, the diamond point tool A is being used for ordinary turning. We will suppose the shaft B is a piece of

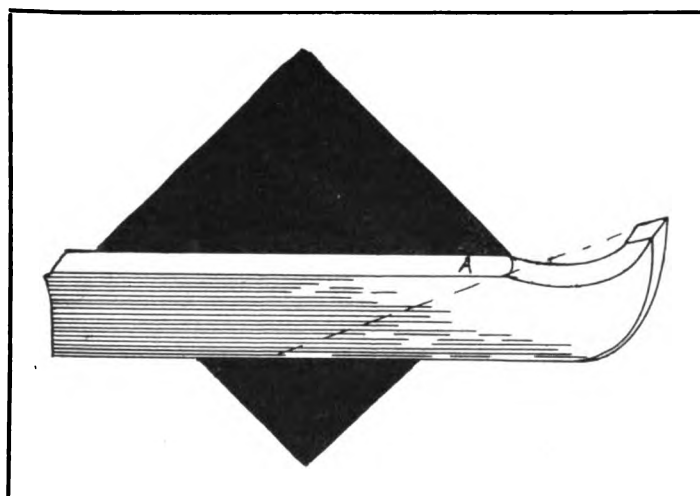


Fig. 1—The Diamond Point Tool Line Indicates Slant of Cutting Edge.

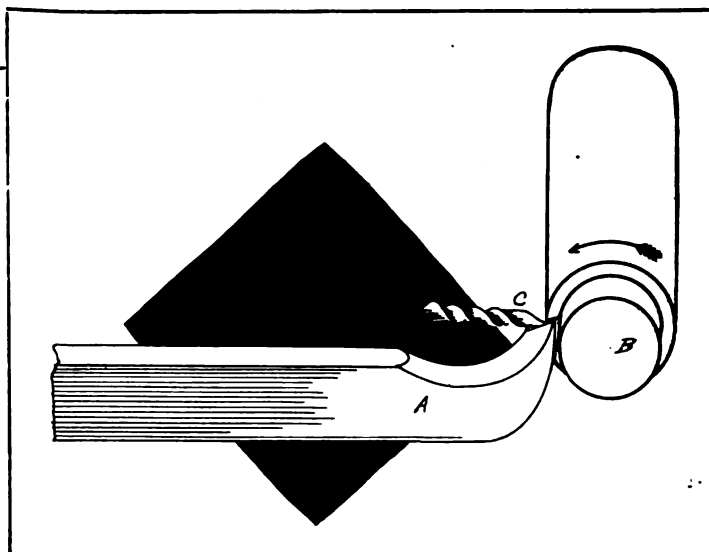


Fig. 2—The Diamond Point Tool Used for Ordinary Turning.

the money invested than a turning lathe. So many times in fitting small bushings it is necessary to alter either the inside or outside diameter a fraction of an inch, and without the aid of a lathe it is next to impossible to do a first class job.

The following information may be of interest to some who have just installed lathes and are not familiar with the handling of the cutting tools of the various kinds.

Cutting tools for use with lathes are made up of a very fine close-grain steel, commonly called "cast steel." By special treatment this steel is made hard enough to cut the metal without chipping the edge of the cutting tool or rolling the edge back. This is brought about by a process we term "hardening" after the tool has been forged to shape. By suddenly cooling the forged tool it becomes very hard, after which the

To sum this up in the fewest words and yet cover the entire field, lathe tools are designed from the nature of their duties. This fact will be noticed very shortly after a few attempts have been made to work stock with different kinds of tools of various tempers and shapes, and it will be but a very short time until one will be able to judge with accuracy shapes, degrees of hardness, and the effect on metal of the different tools.

Referring to Fig. 1, we have a tool commonly known among mechanics as a diamond-point tool. It bears this name because the shape of the cutting surface is that of a diamond. Aside from the diamond point tool just mentioned we have many others, such as the side cutting tools, right and left, and the cutting tool for cutting a shaft apart while being rotated between centers. Then we have the

cold-rolled shaft, which is neither hard nor tough, yet having an equal amount of both. If, in this instance we set the point of the tool A too high so the rake of the tool strikes before the cutting edge, the tool will not cut, and on the other hand, if we set it too low, it will have a tendency to crawl under the shaft and tear the metal off instead of cutting. With a tool in the last mentioned position there is danger of breaking the tool rest or springing or breaking the centers of the lathes. Consequently, it is very necessary to have the tool set correctly to get a smooth cut. A person with little experience will learn to know when a tool is set right by the shaving that is turned off.

The cutting should come clean and smooth and curl in uniform curls as shown at C in Fig. 2. Of course, the curl will be influenced by the depth of the cut,

but the same setting will be very nearly right for a deep cut as it will for a shallow cut. If the tool is correctly set and the speed of the work is correct, the cutting will curl off many feet long without a break, and when stretched will have quite

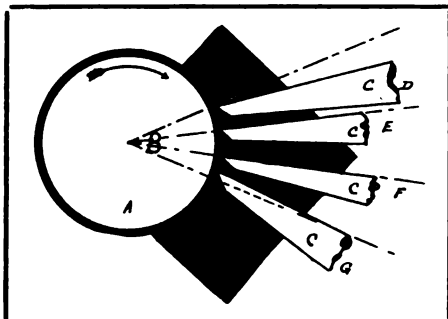


Fig. 3—Positions for Different Metals.

a little spring before breaking. The roughing cut can be quite heavy, while the finishing cut should be very light and with a slow travel to leave a surface as smooth as possible. The finishing of very accurate work is usually done with a fine file or a special grinding attachment.

As already stated, the position of the tool to correspond to the kind and hardness of the metal is of vital importance to get the best of results and have no unnecessary strain on the lathe centers on which the work is supported. In Fig. 3 we have A, representing a shaft traveling in the direction indicated by the arrow, while at B are the cutting angles for the different tools, and C, the tools. Each tool has the top and bottom faces ground exactly alike. In position E, the top face of tool C is at an acute angle above an imaginary horizontal radial line, hence the tool has a negative top rake, this setting being about right for brass work under ordinary conditions.

In position F the top face has no rake of any kind, and the setting in this instance is suitable for brass work and mild steels not too tough and having a slight tendency to brittleness. If the tools were made to cut brass in position D or G it

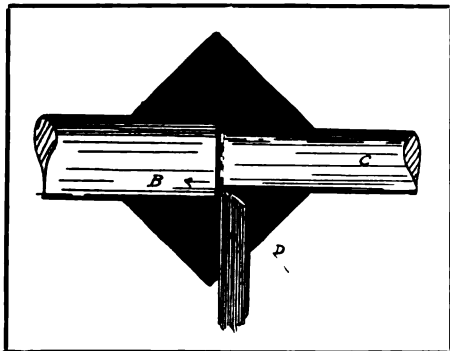


Fig. 4—Tool Set for a Straight Cut.

would not cut the metal but would tear or rip it, while on the other hand if the position we have for brass were applied to iron the effect would be very similar to the wrong setting on brass. Therefore, it will

be readily seen that though each tool may have its surface for the cutting edge at the same angles, yet we can readily see that the strength of the cutting edges depends entirely on application to the work. Thus the edge at E will be weaker than the edge at G.

Now another matter of importance to consider at this time is the top rake and the presentment of the tool to the work. We should always bear in mind that the strain of the cut falls upon the top face of the tool, and therefore the direction in which the strain is exerted is the direction in which the tool will endeavor to move. The tool should be sufficiently strong so that when the side pressure comes against it there is no tendency to bend or spring it, for not only is the work inaccurate but there is danger of it gouging sufficiently to break the carriage or spring the lathe spindle. There is a great deal of danger of springing the spindle of a lathe, espe-

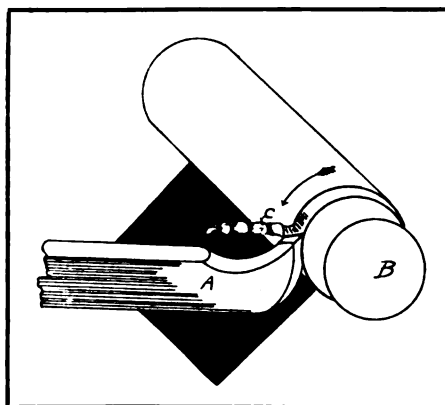


Fig. 5—Light Cut With Diamond Point Tool.

cially a small one on brass or bronze work if the tool is set so it can gouge. Great pains, therefore, should be taken to get the tool set absolutely correct before trying to do a piece of work in brass, as it is much more dangerous than steels or iron.

In starting the tool into the metal it should first be set to feed light, and note the condition of the shaving. It will come off with clean edges if it is correctly set,

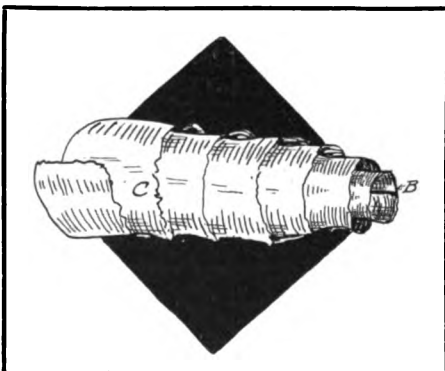


Fig. 6—Appearance of Heavy Cut.

and if it is not set properly it will show a rough shaving not cut but rather torn from the work. A lathe should not be run with the tool set in such a position as to chatter from too much speed.

We have in Fig. 4 a shaft and tool set for a straight cut. In this instance the strain comes on the tool facing, and should be set to curl the cutting as indicated by the dotted line D. The shaft B should have the proper speed to give a

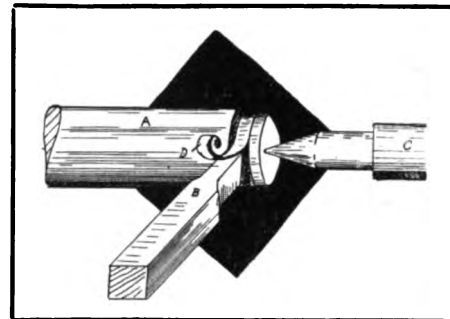


Fig. 7—Parting Tool in Operation.

clean, smooth surface on the reduced part C, just passed over. The point of the tool should be a trifle rounded, thus the surface will be smoother than if pointed too much. In case the cut is only a roughing cut and rather heavy it can be done very successfully with a tool with a reasonably sharp point. The shape of the tool shown much resembles the high speed cutters used in Armstrong tool holders. These holders for ordinary work, especially among beginners, cannot be too highly recommended, for a novice will have plenty to learn without forging and tempering his tools.

In Fig. 5 we have the shaft B, as shown in the cutting operation of Fig. 4, except that the cutting is done with the diamond point tool. The tool should be set so that the cutting will curl as shown at C, with clean cut edges, and if the shaft be reasonably good material it should have quite a little spring. The tool A, when set low as already stated, will strike the rake ahead of the cutting edge, and when forced against the work will only make a bright spot, many times springing the shaft quite a little, especially if the shaft be a little light and a foot or so long. A very small and quite long shaft to be turned successfully must have the cutting edge of the tool applied correctly, or it cannot be turned true from end to end.

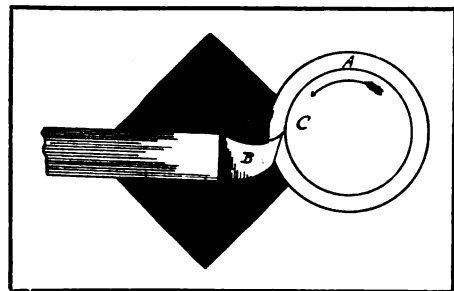


Fig. 8—Facing Tool in Operation.

In Fig. 6 we have a continuation of the cutting taken from the shaft shown in Fig. 5, except that the tool has been forced in for a heavy deep cut without changing the setting. If the tool is correctly set the

cutting will come off in a tight wound coil, cracked very little at the edges but not having the smooth surface that is found on the lighter cut. When the unusually heavy cut is taken it is necessary to reduce the speed of the shaft B, to correspond to the cut, or the cutting edge of the tool will become hot enough to chip or bend.

In Fig. 7 we have a tool entirely different from all others. This tool is known as a cutting off or a parting tool and is used to square up work, cut shafts apart and for many other special jobs. A represents the shaft supported by the back or tail stock center C, and the tool B is cutting

an end from the shaft A. The cutting-off tool should be set with the cutting edge at very nearly a center line of the shaft. If it is set low the shaft will have a tendency to "ride the tool," and the end or cutting edge will be broken down. If too high the shaft will be sprung and pinch the tool. The lower edge of the tool should be a trifle thinner than the top, so there will be a sufficient amount of clearance to avoid a side rake.

In Fig. 8 we have another cutting tool, called the facing tool. This tool permits of an easy free cut and many prefer it, but until one becomes familiar with the setting of the tool it is not advisable, for

the tool has more of a tendency to gouge, that is, to dip and take uneven cuts. This tool is excellent for squaring up the ends of shafts as well as surfacing work in the chuck. It will be found very good for brass work, but should not be used for bronze except by a skilled mechanic.

Lathe work is something that never grows old, and once a man puts a lathe in the shop he will never take it out. All over the country in the small automobile repair shops they are beginning to realize the necessity of a lathe. And in looking over the equipment for some needed item for next year, make it a lathe and you will never regret it.

Good Roads and Trucks Aid Farmers

Chairman John S. Cravens of Highway Transport Committee Expresses Belief That Development of Road Construction and Use of the Commercial Motor Vehicle Will Be the Country's Next Great National Industrial Movement

John S. Cravens, Chairman of the Highways Transport Committee of the Council of National Defense, in an address to delegates at the convention at Philadelphia of the National Association of Motor Truck Sales Managers, discussed the work of the committee in its relation to the motor industry. In his address Mr. Cravens said in part:

"I firmly believe that the development of road construction and the use of the motor truck is the next great national industrial development.

"It has been the Council's policy not to undertake the study of engineering features of road construction, nor to enter too much into the detail of how the value of road construction and use is to be realized.

"The Council also believes that the application of the use of the truck is something which should be properly left to the producers, for it is, in a real analysis, their business problem.

"The Council of National Defense is not selling trucks—we try rather to sell ideas. But one of the purposes of the Highways Transport Committee has been to educate the people as to the proper place of the motor vehicle as an agency of transport in order that it might seek and maintain the place to which its usefulness entitles it.

Vehicles and Roads Inseparable.

"The vehicle and the road must be demonstrated to be complements of each other and inseparable parts of a great agency of public service. Once the people thoroughly realize this, they will demand and have good roads when and where they will serve. We have felt that advocacy of road building as such would not have so good a reaction as education as to what the roads can really do for the people.

"It is a fact, however, that the people are beginning to understand what roads means—not as a means of enjoyment nor as a convenience—but as a great factor in the economic growth of the country. They realize that poor roads mean restriction of the social as well as the commercial opportunities of life, and that good roads mean quicker transportation, cheaper transportation, a saving of labor, and the consequent opening of new channels of employment, broader and nearer markets, and that they are the avenues for a wider and better social relation.

"It is being realized moreover that to no class does road improvement mean so much as it does to the farmer. Let the people once understand that, and we need have no fear concerning road construction.

Road Maintenance Needed.

"No less important than road construction is provision for road maintenance. To build roads without adequate provision for maintenance is an economic waste.

"How is this to be brought about? Without particularizing too far, it might be taken as a fair working basis that in the future the maintenance charge should be imposed upon the traffic and the capital expense involved in the construction should be extinguished by taxation. If at the end of the retirement period our roads were still good, we would have gained that much; and if they were not, we would at least have free credit with which we might build again.

"There is another feature of our work that is of interest to you who are concerned with the future of the motor truck. It is the declared policy of the United States Railroad Administration greatly to curtail the construction of spur or feeder lines. This at once opens possibilities to the motor truck, for the demand for trans-

portation is constantly growing. Some of the railroad authorities openly advocate the establishment of country truck lines, especially those running at right angles to the main rail routes, and I believe this entente could be fostered to the mutual benefit of both parties.

Short Haul Problem Studied.

"Some have even invoked the aid of ourselves and our state committees in a study of the short haul problem, in order that relations of both rail and truck thereto might be better understood, and the economic field of usefulness of each be better determined.

"We have also endeavored to codify all we learn on this great subject, to co-ordinate the efforts of different bodies all working to the same purpose, and to act as a clearing house in which may center the knowledge of the activities of various state highway departments which may again be disseminated in order that all may receive the benefit of that which is developed by one.

"I am happy to state that under the authority of the Council the committee is to be continued. It is now composed of representatives of those Federal departments most closely connected with road use and road construction—the Post Office Department, the Department of Agriculture and the Department of Commerce, J. I. Blakslee, Fourth Assistant Postmaster General; J. M. Goodell, Consulting Engineer of the Bureau of Roads; J. H. Collins, of the Bureau of Markets; Dr. Roy S. MacElwee, Assistant Director of the Bureau of Foreign and Domestic Commerce; G. B. Clarkson, Director of the Council of National Defense, and myself as chairman, constitute the committee.

"This composition is a warrant that the committee has the co-operation and sup-

Care Needed When Buying Accessories

Dealers Must Keep a Watchful Eye on the Way They Purchase Accessories in Order That Stocks May Be Carefully Picked So as to Avoid Danger of Carrying Dead Stock Thus Tying Up Money—Quick Turnover Best

By J. E. Bullard

The automobile business is still a comparatively new business. It has not yet become standardized. Each year the manufacturers place upon the market new models. These models may not be radically different from those of the year before but they do contain some improvements, some changes that are used as selling points and which make it necessary to sell the models of the previous year at a discount in order to get rid of them.

It is through the accessory market that many of the modern improvements are tried out. An accessory may be found that greatly improves the operating economy of the cars. For a few years it is sold in the accessory stores. Then one manufacturer after another incorporates it into his machine until all cars are equipped with it. Instead of improving the operating economy of the car it may add to the comfort, luxury or appearance of the car.

It was not so many years ago when tops were not standard equipment. Since then tops, speedometers, gauges, buffers, shock absorbers and other accessories have been added to one or more makes of cars as regular standard equipment. That which is a rapidly selling accessory this year may become standard equipment on many cars next year, with the result that the demand is very materially cut down.

This is one reason why a great deal of care should be exercised in buying accessories. Buying a big stock of goods with the expectation that it can be disposed of at the regular selling prices in the course of time is not safe.

The demand may have changed or the use of the accessory on cars have been discontinued altogether before the stock is cleaned out. The

Since his return from France last January J. E. Bullard has been engaged in writing trade paper articles and advertising copy. Upon graduating from Brown University in 1903, Mr. Bullard devoted his time to studying retail merchandising and sales methods and writing for trade journals.

He is the author of two standard books on gas merchandising, "Gas Appliance Display," and "Demonstration and Instructions to Gas Appliance Salesmen," published by the Gas Age, New York. For one year and up to the time of the sale of Horseless Age he was on the editorial staff of that journal. He has been connected with some form of retailing since he was 11 years of age, having worked in stores in his spare time while attending school and college.

constant changes in the field make it necessary to watch the demand very closely if money is to be made.

Some very sizable fortunes have been made in the accessory business during the past fifteen years. Some of these were made by men who before opening their first stores knew little or nothing about the automobile accessory business. Their success has been the result of careful buying. In some cases this careful buying was due to the fact that these men had such limited capital that they could not buy in large quantities. In others it was due to native caution and shrewdness.

The man who makes his automobile accessories merely a side line in which he does not take a very deep interest is likely to arrive at the conclusion that there is no money in accessories. The man who makes the accessories his main line and his old business the side line will soon come to the conclusion that the automobile field is the most profitable field.

There is probably no field where the market is growing to such an extent year after year as it is in the automobile accessory field. In this field a dealer's business is bound to increase on account of the increasing demands of the people in his community. This constant increase in de-

mand, however, makes it very necessary to use the greatest care in buying.

The increasing demand means a changing demand. What is a good seller this year may not necessarily be as good a seller next year. Buying must be done for the present and not for the future. Turnovers must be frequent if profits are to be large.

Every year there are placed upon the market new accessories. Some of these prove

to be rapid sellers. Others which look as good at first do not prove up so well in actual service and turn out to be slow sellers. The only way to play safe on these new accessories is to make the initial order more in the nature of a trial order, one calling for only enough goods to try out the local demand and make it possible to determine upon the size of the future orders more intelligently.

Unless the initial orders are made small on all new stock ordered, on all accessories that have not been carried in stock, there is a certainty that before very long there will be a very considerable sum of money tied up in dead stock that cannot be moved at a price covering the cost and which may have to be sold to the junkman.

Ordinarily those accessories which sell the most readily are those which are most thoroughly advertised. Advertising, however, does not mean that the goods advertised are going to be good sellers. The advertising of some new manufacturers is just a flash in the pan. Enough is used to get distribution and to load up the dealers and then it is discontinued, the dealer being left to get rid of his stock as best he can. Some articles scarcely ever advertised have become so nearly standard that they enjoy good sales.

In buying automobile accessories it

is not long profits, the amount of advertising that the manufacturer is doing, or the discounts that are given for large orders, that should determine the size of the order. It is the amount of merchandise that can be sold. Unless the stock is turned very frequently there is bound to be a lot of dead stock left on hand at the end of the year. The only way to turn the stock frequently is to use the very best judgment in buying. Such judgment means that only such goods will be purchased as can be sold readily.

To do this kind of buying it is necessary to keep the finger on the pulse of the buying public. Tastes and demands are constantly changing. What sells readily in one store may gather dust in another. There are at present no fixed standard rules that can be used as a guide except that of keeping in close touch with the demands of the customers.

Concerns which originally took on accessories as side lines are now making the accessories the main line and the old line the side line. It has been possible to make a good profit out of the old line when it is carried as a side line for the reason that the business man has become so experienced in the line that very little attention is required to operate on a good business basis.

The automobile accessories being new, however, require more attention. The business must be studied. It must be constantly watched. It cannot be standardized. It will not run itself. The result is that in case after case the automobile accessory end of the business is made the main line with the result that real profit results. In fact, much more profit results than is the case where the accessories are confined to a side issue.

Any man who has been in business for any great length of time knows just how many times he should turn his stock in a year. He knows just about how large he should make each order. He is able to gauge the demand very accurately. He has reduced many of the problems to a routine. Much of it has come down to a mere matter of bookkeeping.

When taking up a new business all those things which it was necessary at first to learn about the old business

must be learned about the new one. The automobile accessory business is still a new business, even to the veterans in the business. The demands are changing so much from year to year that it cannot be standardized.

Each year finds something new. Each year finds something that was a profit maker the year before losing ground and in a few years there is little or no demand for it.

The automobile accessory business is one that must be watched carefully. It will not run itself. It requires a different margin of profit from that of other lines of business. The overhead is different. The rate of turnover is different. The methods of buying are different. In all respects it will be found that there is considerable difference between this business and any other.

It will also be found that the accessory business offers a greater opportunity for money making than many other lines of retailing. The mere fact that it has not yet become a standardized business means that the shrewd business man can make more money in it than he can in many other line of business. This is another reason why so many men who have taken on accessories as a side line have soon made them the main line and have built up a very profitable business with them.

The men who have made the most money in the automobile accessory field have usually turned their stock four or more times a year. It is not safe to buy much more than a three months' supply of anything at one time unless there is an exceptional reason why this should be done.

Buying unnecessarily large quantities of any items ties up the capital, requires more storage space and very materially reduces the profits even if it results in no dead stock. Very often it is the case, that buying in quantities that are too large results in an accumulation of dead stock that must be sold at a price far below the original cost and the profit that was expected turns out to be a loss.

This can happen on so many items, especially with the new accessories on the market, that all buying should be done with caution. One very good

plan to follow, especially at the beginning, is to select a good jobber and depend to a very great extent upon his judgment.

Asks Uniform Laws Limiting Truck Size and Weight.

Uniform state laws limiting the width and height of motor trucks and the loads to be carried are advocated by Commissioner of Highways F. S. Greene, of New York State. He has called the attention of the War Department to this matter and is taking other steps to interest the officials of other states in his plan. Commissioner Greene favors the passage of a law limiting the width of trucks to eight feet, height to 13 feet and the maximum load to 800 pounds per inch of tire on any wheel.

"The Highway Department is preparing for the motor express era," says Commissioner Greene. "We are building concrete roads and as part of the state's program is promoting motor truck lines it will be the duty of the next legislature to enact laws that will promote transportation development."

Commissioner Greene's letter to Col. Sherrill of the War Department, chief engineer's office, said in part:

"I have noticed that a great many states are beginning to enact motor truck legislation, and, as usual, the laws are not uniform. This, of course, is going to hamper not only the manufacture of motor trucks but will tend toward confusion generally in motor truck traffic.

"The purpose of this letter is to call the attention of your department to the need of having the different states enact uniform laws and to give you our idea of what the three principal limitations on trucks should be, namely, maximum width of body, eight feet; maximum height of truck, 13 feet; maximum load on any wheel, 800 pounds per inch of tire.

"In regard to limiting the length of a motor truck train composed of the tractor and trailers, I do not expect trouble from this. Until some air brake device is invented which will allow brakes to be applied to the wheels of the trailer we are not apt to have more than one or two trailers.

New Zealand Beckons to Motorists

Antipodean Subscriber Foresees Time When Americans Will Drive Across Country to San Francisco, Leave Cars There and Visit His Country During Our Winter—Writer Sells American Tires and Accessories in Wanganui

One of New Zealand's dealers, George H. Pownall, of Wanganui, declares in a letter to the *AMERICAN GARAGE & AUTO DEALER* that before many years have elapsed he is of the opinion that many Americans will

Mount Egmont, which is a perfect cone 8,500 feet high and has an extinct volcano. The road is so narrow that two cars cannot pass, so a telephone wire is provided by means of which a motorist can ascertain if a

car is coming down before commencing an ascent. He tells of once attempting to climb the road after a heavy storm with the result that his car was bogged and had

hundreds or thousands of motorists whose automobiles have been stuck in some mud hole in this country and have been compelled to stay with the cars all night in order to try to get them out if they could when daylight



G. H. Pownall Testing a Pennsylvania Tube in One of Wanganui's Streets in Front of the Town Hall.

journey to his country to enjoy their summer and escape our cold winters.

He thinks that a good number of Americans will drive their cars across country to the Pacific Coast and leave the vehicles at San Francisco while they travel to New Zealand. And Mr. Pownall says they will agree with him that it is a wonderful little country after they have visited it.

Mr. Pownall writes about an automobile road up to the summit of

to be dragged out with horses on the following day.

This is an experience a great many American automobile owners surely can match. Cases are on record where American motorists have not been so fortunately placed as to be able to leave their cars alone for the night, and so they are not likely to be deterred from journeying to New Zealand because of the mishap that befell Mr. Pownall. In fact, there are



Street Scene in Wanganui, New Zealand, Showing Pre-dominance of American Cars.

came or call for help if they failed.

The gasoline for all automobiles in New Zealand is taken to Wanganui from California in sailing schooners, taking about 70 days for the journey. Mr. Pownall writes that there is much beautiful scenery along the upper reaches of the Wanganui River but there are no roads anywhere near it at present. Tracks have been cut which will ultimately be widened to roads.

On the streets of Wanganui, New Zealand, American-made cars are everywhere in evidence and their predominance speaks well of the builders of these products. So too American-made tires and accessories are featured by the enterprising New Zealand dealers and it is not unusual to see these American products undergo tests in the streets of Wanganui to demonstrate their qualifications. Certainly tourists planning to visit New Zealand will feel at home to see their favorite cars and tires even though 5,700 miles from the States.

Mr. Pownall is managing director of the G. H. Pownall Rubber Company, New Zealand distributors for the American-made Pennsylvania vacuum cup tires, AMBU electric testing sets, Bailey non-stall differentials, Locktite patches and King tail lights.



It's a Far Cry from America to New Zealand—5,700 Miles and More—But American-made Tires and Accessories Are Featured by This Enterprising New Zealand Dealer.

Advertising Cuts Must Be Cared For

Automotive Dealers Who Use Illustrations in Their Catalog, Circular or Newspaper Advertising Should Pay Just as Much Attention to Their Cuts as to Any Other Valuable Property—A Good Plan Is Suggested

By Lester G. Herbert

Illustrations are an important item in effective automobile accessory advertising, whether this be done by catalog, circular, or newspaper space.

Those who have had occasion to buy cuts within the last year or so have doubtless discovered that the war has had its influence here as well as elsewhere. Even though the cuts may be given free, as is sometimes the case to advertise a special line, it is the retailer and ultimately the consumer who pays the bill. Consequently, it is good business and the wise practice of thrift to take care of cuts in the proper manner, for if they are scratched, or the surface injured, they will not make a clear impression.

Distinct, truthful illustrations help the prospective customer to visualize thoroughly the article offered for sale. As "seeing is believing" it behooves anyone who uses cuts at all, and goes to the expense of distributing or paying for printing matter, to see that it is the best which can be purchased.

Yet, in spite of these obvious facts, the average retail automotive dealer is singularly neglectful of the cuts which are in his possession. This is equally true, whether he buys them or has them furnished to him by the manufacturer. Anyone in business should be willing to give a little systematic care to property of this kind.

A Usable and Practical Plan.

The following plan has been worked out and answers most purposes nicely. A few changes may be necessary to suit the individual business, but with such adaptations, the idea is thoroughly usable and practical and in the course of time a valuable assortment of illustrative matter will be accumulated.

Anyone interested in such a collection will soon learn to ask for them, for a service of free cuts is often furnished with any line of goods being stocked. Many manufacturers take the stand, and wisely too, that

if a retailer isn't interested enough to ask for cuts, he will scarcely use them if they are given to him.

First of all procure a good-sized blank book alphabetically arranged. This may be of the scrap book or loose-leaf variety. One point is essential, and that is, that the book will open out and lie flat without being held.

Now take such cuts as you have on hand to your nearest printer and ask him to make you a proof impression of each. If you are advertising with him, he will do this for you without charge, or at most, the cost will be a mere trifle. Cut these pictures into neat squares or oblongs and paste each one into the blank book under its initial letter. Thus spotlights would come under S; lenses, under L; motor meters, under M; or bumpers under B.

Numbering of Illustrations.

Number each illustration in the book plainly in ink, respectively: S 1; L 1; M 1; B 1. Put this lettering neatly in the middle, below the cut. This marking means that the spotlight is the first illustration under the letter S, and the lenses the first illustration under the letter L. Take the cuts themselves from which these impressions were made and on one side label with ink, paint, or a paper sticker as a small identification mark.

Thus, if you want an illustration of a spotlight, lens, motor meter, or bumper, you will turn to the initial of the article in the book, locate the particular picture you wish to reproduce, notice its identification number and locate the cut so marked. It is often very difficult without such marks to tell what cuts really are.

A comical incident comes to mind of a retailer who wished to advertise a beautiful line of "hope chests" for brides. He located a cut hastily, by looking at its surface. When the illustration came out, it was an elab-

orate coffin, with the words "For our charming brides," beneath it.

The book of pictures will prove a valuable index and a great time saver as well.

Protect the Cuts.

The delicate surface of all cuts should be protected by a covering of blotting paper, tied or snapped in place with a string or an elastic. A folded pad of tissue paper will serve the same purpose. The object is to furnish a soft covering, which will be snugly held in place, to protect them from dust and scratches. It is only the work of a moment to cut such a pad of the right size.

Even now we do not wish to dump all of our cuts into one box, for in handling them, the protecting pads will be loosened. It is a relatively simple matter to have built a little case of drawers for the storage of these articles. Or if you do not want to go to even this trouble, have a paper box maker make as many stout hinged boxes of suitable size as you desire. In the average business, ten such boxes will be enough. Each of these should be plainly labeled, so as to show that Box 1, holds cuts which come under the classification of A and B; Box 2, C and D, etc. Toward the end of the alphabet three letters may be combined.

If the stock of cuts is extensive, a box or drawer for each letter should be kept. Now the system is nearly complete.

After having located the illustration you want in the Index Book, you know its letter and number and it is but the work of a moment to turn to the drawer or box bearing that letter and to find the cut with the same letter and the required number upon it. This makes the handling of a lot of cuts unnecessary and smoothes out one of the troublesome wrinkles in advertising.

If the printer had no other cuts

than yours or mine to look after and nothing else to do, but to see to *them*, there would be little chance of our property getting lost. But as it is, our printing is only a small part of what he must accomplish in the regular transaction of business. And so, unless we carry our system on still farther and make it complete, our cuts will be likely to get lost.

Unlike the sheep of Little Bo Peep, they will not come home of their own accord bringing their tails behind them. In the course of a year of advertising, a good many dollars' worth of cuts will get astray, if they are not looked after and the worst of it will be that when you want to use them again and expect you have them to put your hands on, that they will be noticeable only by their absence. While you are waiting to have more cuts made, your competitor will get *his* advertising out and you will lose a lot of profitable business.

The best way to keep track of cuts,

is to have a separate book for the purpose. This book should contain an inventory list of cuts, each being entered in this manner: S1, spotlights; L1, lenses; M 1, motor meters; B 1, bumpers. Of course these will be alphabetically arranged and in the case of the sticker getting off or the identification mark being blurred, it can quickly be replaced. All new cuts should be properly listed under the right letter of the alphabet.

Once a month or at longest, once in three months, the inventory of cuts should be checked up to see that it is accurate and the goods where they belong. A short time will do this, if it is done regularly. Next, an account should be opened up farther in the book with every person to whose care cuts are entrusted. It will take but a moment when the advertising goes to the daily paper, or some special work to the printer, to turn to his account and to charge him with the date U 1, S 5, R 19, Y 11.

At the end of the month or even the week, if a good deal of advertising is being done, the statement of the cuts should be rendered by letter and number, so that they can be identified and returned. It is well to have a distinct understanding as to, first, how cuts shall be returned—whether by parcel post, special messenger, or how. This will save misunderstanding, delay, confusion and loss.

Any business man who takes care of his cuts in this manner will be sure to be painstaking and methodical in the conducting of his general business. And in these days of close competition and the high cost of overhead, the only way to insure a proper margin of profit, is to attend to details in a thorough-going manner.

It is not necessary that the business proprietor do this himself, but there should be somebody in his force upon whom the responsibility can be laid.

Take care of your cuts—and your cuts will help take care of you.

Good Window Displays Help Sales

Tire Vulcanizer Who Dresses Windows of Employer's Establishment After the Regular Business Hours Knows that a Good Many Sales Have Been Made Because Merchandise Was Attractively Arranged Where Public Could See It+

By Arthur C. Brown

When I first started working for W. E. Winterrowd, proprietor of the Winterrowd Garage at Orange, California, very little attention was paid to the condition of the windows. But since I have been on the job I have tried to keep them tidy and clean.

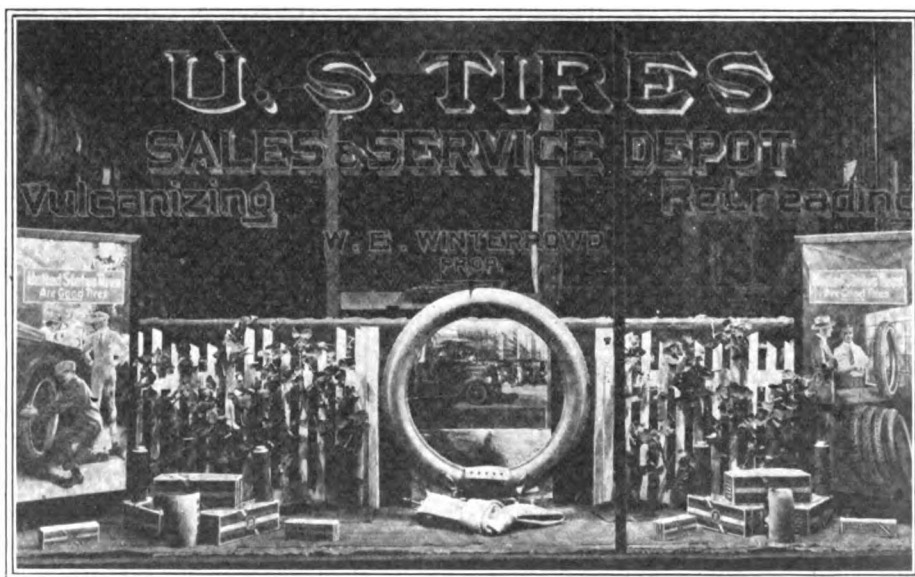
I notice now that people passing the store stop to look in at the window displays, and I know that we have made a good many sales simply because our merchandise was exhibited where the public could see it displayed in an attractive arrangement. We have had several write-ups in the local newspaper regarding our window displays and I am sending a photograph of a late one which I hope will win a prize.

I have been employed at the Winterrowd Garage as a vulcanizer since last November and altogether have had seven years' experience as a vul-

canizer. I also sell tires and automobile accessories in addition to my shop work and window dressing.

Before I began work for Mr.

Winterrowd I was employed by several tire merchants in Los Angeles as a tire repairman. I change the window displays for Mr. Winterrowd



Attention-Attracting Window Display Which Combines Symmetry of Arrangement With a Very Artistic Commercial Effect.

about every 10 days and have no regular period for leaving a display in the window.

This period depends upon when I can find the time, and when I am very busy in the shop with a rush of repair work I dress the windows at night after the regular business hours.

I found out that you were inter-

ested in window displays by reading the AMERICAN GARAGE & AUTO DEALER and hope to win more \$5 prizes from time to time. The display shown in the photograph was arranged in a comparatively short time. The fence was made by painting laths and sawing the ends as shown. The pictures at each end are United

States tire posters in frames and either natural or artificial foliage can be used to decorate the fence.

[Editor's note.—Mr. Brown won a \$5 prize for the photograph of a display he sent in for our April issue. Pictures of window displays are always welcome and when used the sender receives a prize of \$5.]

The Law on Over-Exertion Injuries

Courts Have Decided that Workmen Who Suffer Hemorrhages or Strains as Direct Results of Over-Exertion While Engaged in Their Regular Appointed Tasks Are Entitled to Receive Compensation Under Employers' Liability

By Chesla C. Sherlock

Those who are subjected to more or less strain in the work which they do, particularly where the work done requires them to indulge in heavy lifting and moving, are subject to the possibility of over-exertion.

The employer has a more or less certain liability imposed upon him in cases where there has been an accidental injury of one of his employes. He also has a more or less certain liability imposed upon him in cases where he has been guilty of negligence and has failed to obey the statutory requirements of the State in which he does business.

The fact that he may be liable for compensation in case of the over-exertion of any of his employes has probably never occurred to him before, but such a possibility is very apt to come to pass, as we shall see presently.

The workmen's compensation acts undertake to provide compensation for such workmen as are incapacitated from work by means of an accident. Where the recovery is attempted under the compensation acts, the question naturally arises: Are over-exertions, strains, hernia or other injuries due to over-exertion, compensable under the acts?

An accident has been defined by the courts to be any unlooked for and untoward event happening within chance and not through intention or design. In other words, the term "accident" is given its ordinary meaning under the compensation acts.

If a workman suffers a strain while in the course of his employment and the strain results in hernia, the liability of the employer is more or less in doubt. In the earlier decisions under the compensation acts we find that hernia was declared to be a compensable injury in the majority of cases and the employer was required to pay compensation to the person sustaining such an injury just as he was required to pay compensation for the accidental loss of a finger or hand.

But the question of hernia has not been allowed to rest in peace upon these old decisions. There is a school of medical men who contend that a hernia is a disease and not the result of any sudden tearing apart of the muscles and ligaments. They state that people are pre-disposed to hernia and that it is of slow origin or growth, but that sooner or later, upon a favorable opportunity, it will manifest itself. They cite cases of it where even the slightest agitation has brought it about, as where a man was laughing at a joke and suddenly found that he was suffering from a hernia.

Those opposed to this idea maintain that hernia is not a disease in any sense, but that it must always be due to some unusual and sudden strain causing the muscles to part and permit the hernia to exist.

The merit of this disagreement to employers is simply this: If hernia is a disease, it certainly cannot be said to be an accident in the sense that we use the term today. If it is not a dis-

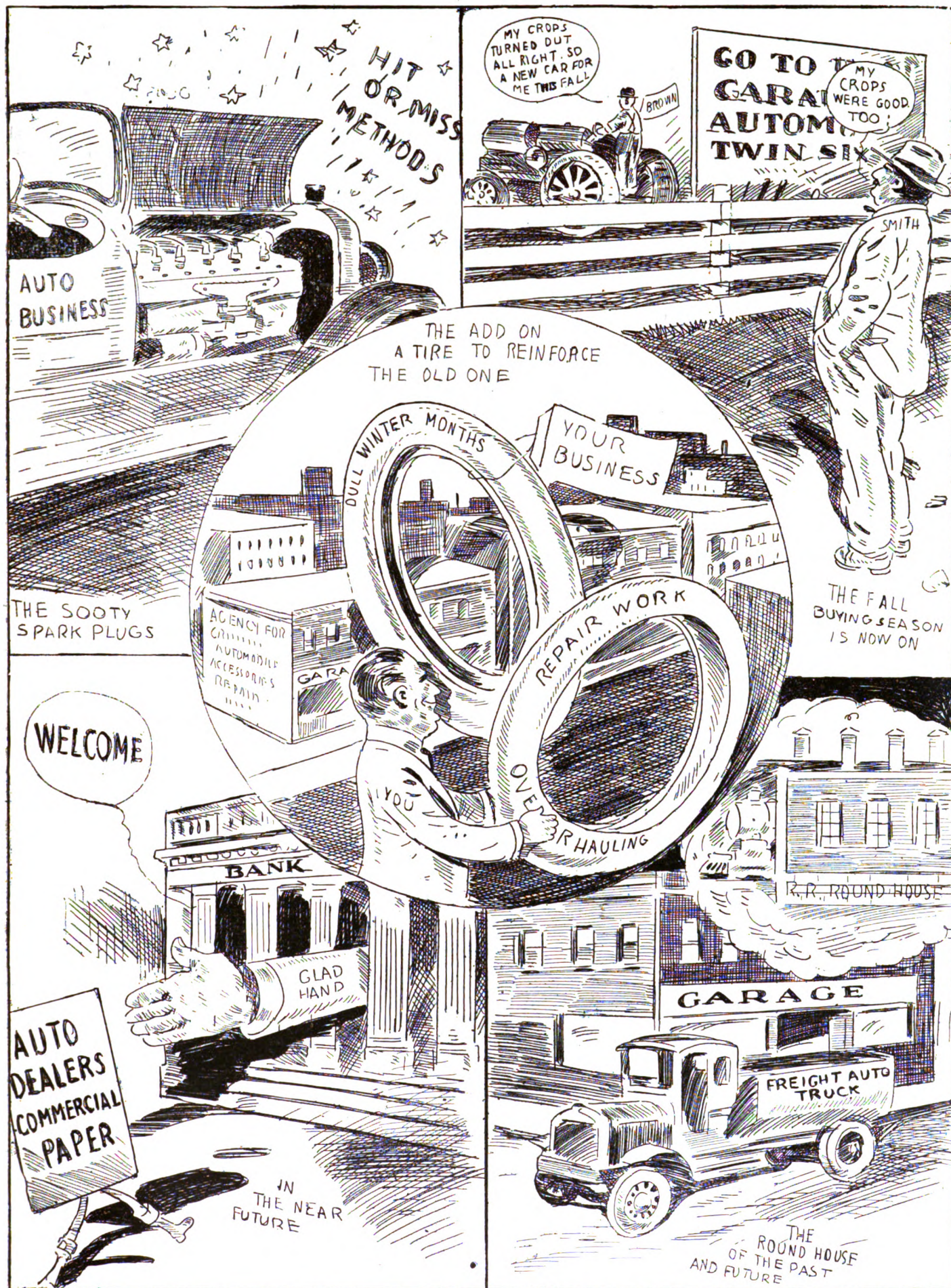
ease, then when it does take place it must take place under circumstances which would tend to indicate that it arose from accidental misfortune.

While the courts have not departed entirely from their former opinion that hernia is an accident, they have certainly changed their attitude and they are more cautious as to the way in which they decide hernia cases. So the case of the employer is more in doubt than ever.

The opinion of one of the courts seems to indicate the new idea concerning hernia better than anything we have found upon the subject. This court said: "Compensable hernia results from specific accident or incident involving unusual conditions such as a strain or fall, or other fortuitous experience which may be definitely described as to time and place and circumstances and attended by demonstrations of distress at the time the injury occurs."

What does this mean to the employer? It simply means that hernia, in order to be compensable, must clearly be the result of an accident and it must be fixed as to the exact time when it occurred. Unless the workman suffers such an accident and *knows at the time* that something has happened and further that the "something" is so acute as to call for "demonstrations of distress" then he is not entitled to compensation from the employer.

Too often workmen suffer a strain and stop work a few minutes, then



resume it and several days later discover that they are suffering from a hernia. They then attempt the recovery of compensation, but under the decision mentioned, they would not be able to do so, unless they could clearly link the injury up to the employment by means of an accidental happening which robbed them of their earning capacity.

And, likewise, if the hernia happens under conditions not calling for a strain or over-exertion on the part of the workman, the chances are that his hernia is not compensable. Furthermore, it must arise out of and in the course of the employment. Any hernia arising from causes independent of the employment, even if upon the employer's premises, is not compensable.

The liability for ordinary strains and over-exertion on the part of the employee is practically the same that it is in the case of hernia. However, the strictness to be applied in the case of hernia is not present in ordinary strains or over-exertion.

If a workman suffers a strain which completely exhausts him so that he has to stop work and is incapacitated for awhile, he generally will be entitled to compensation. He may suffer a strain today and its effects not be noticeable for several days, but if the strain was the proximate cause of his incapacity, then the employer will be liable for the payment of compensation.

Strains may not, in themselves, operate to cause any permanent injury to the workman, but they may be the proximate cause of such injuries. In one case, a workman was lifting heavy cases of material over his head to a pile, and in attempting to steady one of these cases while it was being taken by another workman, he felt a pain in the back of his neck. The result of this strain was that the workman lost the sight of one of his eyes.

He demanded compensation from the employer. Medical testimony was to the effect that such a strain might

easily be the cause of injury to the eye, so the court awarded compensation.

In another case, as a result of over-exertion, a workman suffered a cerebral hemorrhage, which formed a clot of blood on his brain and resulted in paralysis of his right side.

The medical testimony in the case served to substantiate the workman's claims that the strain was due to the employment and that the strain caused his incapacity. The court awarded compensation to the workman.

Strains, over-exertions, hernia and ruptures are all compensable under circumstances as indicated and they are a part of the employer's liability under the workmen's compensation acts. So the employer must guard against them if he would reduce his liability to the lowest possible point. Strains and over-exertion may be avoided in practically every instance by using enough men to do the heavy work and in proceeding in caution when it is done.

Getting Big Profits from Used Cars

Methods Employed by a Shrewd Business Man Who Realized from Own Experience That Carefully Selected Used Automobiles Could Be Merchandised at Good Prices Explained by Writer in Advertising & Selling's Columns

By Craig Hamilton

Behind the used car business is a trail of wreckage. Business wreckage, I mean—not the junk so commonly sold as a used car. The business has lacked standards and ethics; such discipline as it has received has come more often than not from the court and district attorney.

Yet it can be a decent business, honest and profitable. For instance—there is Sam Brown. Of course, that isn't his name, for he does his own advertising, but it will serve. Back in 1914 when the bottom was dropping out of things, Sam wanted another car. By sheer luck he stumbled onto a slightly used, high grade car—special body.

Now Sam had always had the conservative business man's distrust of second hand goods but the value in this car was too evident to be doubted. Sam bought the car for \$400 spot cash. Within three months a fellow club member offered him \$1,200 for the machine. Though Sam was satisfied with the car and had not considered selling, he could not afford to pass up such an offer.

The easy profit on the deal awakened

Sam's interest in the used car business. In the purchase of a used car by men so financially sound as himself and his friend he saw the sign posts of opportunity. Sam followed the road. To begin with he and his chauffeur knew a "vintage" car as a bon vivant knows wines. So Sam began buying used cars.

At first he regarded it more as a hobby—a side line engaged in for cigar money—for the fun of the game and because it kept him up to the mark. But respecting success and understanding money, and also because he had a business man's regard for his reputation, he applied business principles to his flier in used cars.

The target Sam had spotted was that numerous company of men of business and leisure who, looking for value for the dollar disbursed, demand a car that, not only through the chauffeur's efforts, but by reason of its inherent quality, will stay out of the repair shop. The community in which Sam lived totaled some hundred thousand people, while not more than 20 minutes' drive was another prosperous city of about 200,000.

With the aid of the blue book, club registers and other documents to which he had access, Sam ranged his target. Carefully, as a politician takes a canvass, he prepared his automobile census. This inexpensive card index beside telling him who owned cars, personal foibles of the owners as to makes and models, furnished other information such as a banker keeps about his depositors.

Knowing that a business man expects to pay a fair price for a sound product, Brown realized that cheapness in the pricing of used cars would be a disadvantage. His problem was to avoid the special cut rate of the bargain sale and yet show the prospective purchaser a substantial saving. These considerations saved Sam from the pitfall into which most "used car" dealers blunder.

Never for a moment did he consider peddling his cars among people who had a few dollars put away in the savings bank. He stuck to his carefully selected list of people who had never bought, nor thought of buying, a used car. Dealing in "vintage" cars, Sam Brown wanted "vin-

tage" customers. Need I add that about this time, Sam began to employ printer's ink?

The subject of used cars was thoroughly aired in a series of interesting articles in all of the local organs. First there were human interest stories about cars; presently the articles advanced the fact that the man who knew preferred certain models of used cars to new ones. With fine business logic Brown developed his enterprise.

First he visioned a market. Then with scientific publicity he suggestionized this market. Meanwhile though, occasionally, as a favor to a friend, and at a profit, he sold a car he had "picked up for himself." Nothing indicated that Sam Brown was in the used car business. But the mental fermentation that was to produce desire was at work.

People began phoning Sam to ask if he knew where they could get a car. Others with a car for sale, asked him to let them know if he heard of a possible buyer. And all the time, with the instinct of a bird dog, the shrewdness of a horse trader and the discrimination of a picture dealer, Sam

was acquiring the very cream of used cars.

Finally when he had by the ears the world in which he was interested, Sam staged a quiet and select automobile show of his own, exhibiting a few very special used cars—admittance by invitation only. No salesmen were connected with the show. The only literature was a swagger little booklet that, after quoting the local press on certain rare models of used cars, took up—a page to a car—the exhibits in the show.

The whole thing was deftly done, the commercial aspect skillfully concealed and all the emphasis thrown on car value. The cars literally sold themselves. That's all right, you say, but how about the old buss a chap wants to turn in when he buys a car. Sam took those, too; not at the price the agent who sold a new car would have allowed, but at a price which, when taken with the amount paid for the Sam-Brown-Used-Car, still represented a substantial saving.

Unless the car was a "vintage" model it was not sold locally but was disposed of elsewhere or traded for a flivver in good condition. The cunning little flivvers took

to themselves coupe or landaulet bodies, creton upholstery, fitted with flower glass and vanity case; they arrayed themselves in rich purple, Spanish yellow, white or horizon blue, in which raiment they worked nicely into Sam Brown's used car business which had become a corporation by this time.

The other day I was in Sam Brown's town. He sent his own pet limousine to the train for me. I have ridden in that car at intervals for six years. Its upholstery and springs seem to carry one on air; the motor runs like a fine watch. I spoke to William, the chauffeur, about it as I was leaving. He smiled, patting the wheel affectionately:

"They don't make cars like this any more," he said.

Unconsciously the man voiced the basic principle of Sam Brown's used car enterprise.

Upon the knowledge Brown had, he erected a successful demonstration of his policy of applying business management, its standards and ethics and the educational power of intelligent publicity to the discredited business of selling used cars.

Trailers Shown in Motor Truck Tour

Milwaukee Dealers Add Feature Lacking in Previous Demonstration Runs—Operators of Inter-city and Rural Express Lines Find that Trailers Increase Their Profits—Semi-Trailers Save Time for Chain Store Concern

By H. W. Perry

General Manager, Trailer Manufacturers' Association

From ten to a dozen trailers and semi-trailers were drawn by motor trucks in a one-day demonstration truck tour that was organized by the Milwaukee Automobile Dealers, Inc., in conjunction with the opening of the automobile, motor truck and trailer exhibition at the Wisconsin State Fair this month.

The trailers in the run were also exhibited at the fair. Four makes represented by Milwaukee dealers were entered in the tour. Bart J. Ruddle, director of the State Fair motor vehicle exhibition and manager of the annual Milwaukee automotive show, arranged details of the display and the truck tour.

Now that the dealers of Milwaukee have taken the initiative, it is to be expected that dealers' associations in other cities that are planning motor truck demonstration tours like the one held by the St. Louis dealers in June will also have trailers in these runs. A committee in Des Moines, Iowa, which is making arrangement for such a tour to start October 13, will consider the question of trailers at a committee meeting to be held soon. The committee represents the local Chamber of Commerce, the Iowa Motor Trades Bureau and the Des Moines Truck Dealers' Associa-

tion. R. H. Faxon, general secretary of the Chamber of Commerce, is chairman of the committee.

These demonstration tours, which make circuits of several hundred miles through the rural sections, are held for the purpose of affording farmers and merchants in the country sections the same ocular proof of the advantages of motor haulage as city dwellers have every day in their local streets through the use of trucks by private business houses.

Trucks hauling trailers and semi-trailers, a novelty in many places, will add interest to the demonstration and attract particular attention to the trucks drawing them. The ability of the trucks to pull loaded trailers over the rural highways will be convincing proof of their power and stamina. The evident economy of hauling double loads will be a telling argument in favor of the trucks.

Interest in trailers has developed rapidly during the last two years and farmers are beginning to learn the advantages of trailers as used with motor trucks and passenger cars. There will be an obvious advantage and no little advertising value in showing that a 2½-ton or 3-ton truck can haul a 5-ton load on a semi-trailer or a

2½- or 3-ton load on a four-wheel trailer in addition to its own load.

Two kitchen trailers are now being hauled across the continent with the Motor Transport Corps army train. A tire company that has been operating its own motor express line between Akron, Ohio, and Boston for the last two years, has hauled a trailer with a load of more than five tons over the route by way of Pittsburgh.

Many automobile and truck dealers have taken agencies for trailers, which is a logical development, as the two lines go together. Truck manufacturers not only recommend the use of trailers with their regular models, but many of them manufacture special road tractors for them.

Dealers entering trucks in these runs have a fine chance to show what their trucks can do in the way of hauling big loads most economically and in a way that will appeal to spectators.

Operators of inter-city and rural motor express lines are beginning to use trailers with their trucks as a means of making their operations pay better profits. The following chief advantages are claimed for the use of trailers:

They double, sometimes more than double, the hauling capacity of each truck.

There is a saving of about 80 per cent in the cost of hauling the extra load.

One driver handles the double load.

Trailers take care of excess shipments in the busy season.

It is much cheaper to lay up the trailers in dull seasons than to let trucks stand idle.

Overloading of trucks is avoided.

Waiting time of trucks and drivers is saved while trailers are being loaded and unloaded.

The loaded trailer can be left at an intermediate point for loading or unloading while the truck proceeds to its own destination, the trailer being picked up on the return trip.

Smaller and cheaper trucks haul the same tonnage with trailers or semi-trailers as trucks of double their capacity. This is important where roads are poor and heavy trucks get stalled.

Operating and overhead expenses are all reduced when small trucks and trailers are used.

A fleet of 20 tractors and 37 6-ton semi-trailers handles deliveries of groceries to the chain stores of the Atlantic & Pacific Tea Co. throughout the state of New Jersey from the Jersey City warehouse. The tractors are of five tons capacity and each trip averages about 40 miles, with stops at about 40 stores. Two trips are made daily.

Standard motor trucks proved an economic failure in this service because of the time lost while loading. By the use of semi-trailers the waiting time of the tractor and its driver has been reduced from two hours to only eight minutes. The tractors start on their first trip in the morning with loaded semi-trailers and while they are on the road eight or ten other trailers are being loaded at the warehouse platform.

When the tractors return, an average of only eight minutes is required to attach the loaded trailers ready for the afternoon trip. Jacks are used for raising the front end of the trailers to disconnect them from the tractors and lower them on wooden horses ready for loading, but the company is planning to install an overhead lifting system which will be an improvement on this method.

For supplying its 3,900 chain stores throughout the country the company operates 108 motor trucks and tractors in 10 different cities and delivers nearly 200,000 tons of groceries a year with them. The prompt, certain and economical daily distribution of supplies to the retail stores by means of the tractors and trailers insures quick turnover of stock and is an important element in the success of doing business on the low retail price plan.

Motor Truck Convoy Is Led by Band

Well-Known Band Which Has Made Cross-Country Trip Several Times Accompanies the United States Motor Transport Corps on Transcontinental Tour—Entertains Soldiers Enroute and Crowds at Various Stops

The United States army truck-train, in the premier military test of the Lincoln Highway, is nearing its destination. This is the first transcontinental tour of the motor transport corps, and it is a momentous trial of the motor vehicle as an agency of peace as well as of war.

The truck-train left Washington on the 7th of July, and consists of 65 army trucks of all descriptions; staff, observation, and reconnaissance passenger cars, motorcycles, ambulances, tank trucks, mobile field kitchens, mobile repair shops, signal corps searchlight trucks, and a personnel of 290 army officers and men.

This cross-country trip of the motor transport corps will in its way be a historic event. The Lincoln Highway Association worked with the War Department and the officials of the motor transport corps in the preliminary steps, logging the various routes, and providing necessary data.

When the train left Washington, H. C. Osterman, field secretary of the Lincoln Highway Association, had charge of the ceremonies that marked its departure and F. A. Seiberling, president of the Goodyear Tire and Rubber Company, of Akron,

Ohio, the president of the Lincoln Highway Association, made an address at the point of starting. These two men noticed the lack of any band or other form of amusement for the men, and as the trip was also to be in the nature of a recruiting campaign for the motor transport corps, Mr. Seiberling immediately tele-

trip, and smoothed over many hard hours. The band gives concerts at all stops, and has been of great assistance to Dr. Johnston, the Government official along in the interest of good roads, as it helps entertain the crowds that he addresses.

When the Goodyear truck joined the government convoy it was a question which excited the most interest—the band or the big pneumatic tires. These tires are 44x10 pneumatics, with the well known Goodyear all-weather tread, and their size and business-like appearance excited favorable comment not only among the men of the train, many of whom had never seen tires that big before, but among the people who came to view the big



The Band and the Big Pneumatic Tires on the Truck Which Carried It Were the Features of the United States Motor Truck Convoy on Transcontinental Tour.

graphed to Akron to have the famous Goodyear band join the convoy on its way west through Ohio.

The Goodyear officials immediately got busy and when the train neared Akron it was joined by a monster Goodyear truck, shod with heavy-duty pneumatic tires, and carrying a uniformed band of fifteen pieces. This made a welcomed addition to the caravan, and the band has done wonders to maintain the morale of the hard-working "gas hounds" in their record-breaking

truck-train. This particular pneumatic-tired Goodyear truck was one of a twain that had last year made the transcontinental trip from Boston to San Francisco, and back to Boston, and was in charge of the same drivers who had made that trip. Thus the truck and its crew were a welcomed addition, while the band enlivened things generally.

The Goodyear band has been one of the big features of the trip, and receives fa-

(Concluded on page 48.)

Tentative Chart of Accounts Set Up

An Analysis of the Accounts Outlined in the "Assets" Division of the Tentative Chart of Accounts Set Up for Automotive Dealers—Criticisms or Suggestions from Readers as to Variations Are Welcomed

By J. Newton Boddy

Manager, System Department, Tanner, Gilman & Ellis, Chicago.

Cash.—All cash receipts are posted a debit to this account. Cash receipts are from customers, from sundry debtors, from cash sales, from borrowers on notes, from banks on notes payable, from finance concerns on notes and accounts receivable discounted, cash returns on allowances, rebates, or credit memos, from vendors.

Cash on hand at start of business is debited to cash account. Checks are to be drawn for all cash payments other than those made out of the petty cash. Checks are drawn at convenient intervals to reimburse petty cash. All checks drawn are posted a credit to cash. The difference between cash debit and cash credit will always be your cash balance, your cash on hand and in the bank.

In connection with your cash account, you will carry a bank register or bank registers to keep a memo account of deposits and checks on your bank or banks. This memo should be checked at regular intervals with bank statements to prove the accuracy of your cash balance.

Petty Cash.—All currency items set aside for use of, or to reimburse, petty cash are posted a debit to petty cash. All payments made from petty cash; in other words disbursements in currency, are posted a credit to petty cash. The difference between the debit and credit of petty cash should at all times be the amount of actual cash in the petty cash drawer or fund.

Liberty Bonds.—This account is debited with par value of all Liberty bonds received, is credited with par value of all Liberty bonds disposed of. The difference between debit and credit Liberty bonds will be the amount of Liberty bonds on hand at par value.

In this connection, we suggest you

set up an account, "Premium and Discount on Liberty Bonds," to which will be posted the difference between par value and purchase price, and par value and sale price on purchases and sales of Liberty bonds.

This account will be charted under "other income" or under "other deductions" according as it shows a net profit or loss.

War Savings Stamps.—This account is debited when war savings stamps are purchased or received, and credited when war savings stamps are sold or issued. The difference between the debit and credit will show the amount of war savings stamps on hand.

Postage Stamps, Revenue Stamps, etc.—The preceding remarks on war savings stamps are equally applicable to these accounts. Generally, postage stamps, revenue stamps, etc., are charged direct to expense. This method, though more convenient, is not very correct.

Notes Receivable.—This account is debited on receipt of notes issued in your favor and is credited with the amounts paid on the same notes. The difference will always show the balance due on "Notes Receivable."

In this connection it may be said that it is common practice to credit "notes receivable" with the amount of "notes receivable discounted." In such a case the balance on "notes receivable" will be the balance due you only on notes receivable.

We believe the best practice for the average automotive dealer will be to carry "notes receivable discounted" as a liability to be cleared the same time as "notes receivable." That is, "notes receivable" would be credited when you had been notified that "notes receivable discounted" had been paid.

Accounts Receivable.—This ac-

count is often termed "Customers" and shows the amount of your customers indebtedness to you. It is debited with all charges against the customers and credited with all moneys received on account of credits of any kind allowed customers. The difference between the debit and credit for the account shows the amount due you from customers.

It is common practice, where the number of accounts is limited, to carry under "accounts receivable" every one who is indebted to you in any way. This is not considered good practice.

Deposits Receivable.—Parties or concerns indebted to us for deposits on cars, parts or contracts, are listed under this account. It is usually carried with concerns with whom your purchases are greatest.

It is usual to keep this account separate from the open purchase account. The open purchase account represents a liability while "deposits receivable" represents an asset. The account is debited with the amount of moneys deposited and is credited when this deposit is returned in cash or by contra account, or it is credited with partial return of the original deposit.

The difference between debit and credit on this account will be amount due you on account of deposits with manufacturers or distributors.

Sundry Debtors.—This account represents accounts receivable other than customers' or deposits' accounts, accounts with members of a partnership or a company, with employees or with others outside the business who may owe for personal advances. It is the usual practice to carry salesmen's accounts by themselves and all other personal accounts under "sundry debtors."

This account is treated in the same manner as accounts receivable—deb-

ited for moneys or values advanced and credited with all moneys received on account or credits allowed. The difference between the debit and credit of the account is an asset and shows the amount due you from persons other than customers.

Merchandise.—As outlined in our previous article, this account embraces: new cars, used cars, gasoline, oil and grease, parts, supplies and accessories, tires and tubes, new trucks, used trucks, trailers, tractors, tops and bodies, batteries, and work in process.

Speaking generally, we debit merchandise with the cost of goods purchased or received and credit merchandise with the cost of the goods sold or issued. The difference between the debit and credit on this account will show the value of the merchandise on hand or, in other words, the inventory.

These remarks will apply equally to any of the foregoing enumerated subdivisions or departments of the merchandise account.

Work in Process.—This account may be considered as a separate account or may be considered as a subdivision of the merchandise account and only taken into our book-keeping consideration at accounting periods.

Treated separately, we debit "work in process" with cost of labor, merchandise and supplies that go into a job and credit "work in process" with the cost of all completed jobs. The difference between the debit and credit of this account will show the amount of your investment in unfinished jobs.

Shop Equipment.—This account represents our investment in tools, machines, tanks, engines, shafting, pulleys, service cars, wash rack, hose, battery charging equipment, cranes, pulleys, welders, vulcanizers, etc. The account is debited with the cost value of all purchases or receipts and credited with the cost of all sales or issues, cost of items lost or destroyed, and an amount to take care of loss by depreciation. The difference between the debit and credit will be an asset and show the inventory value of shop equipment.

Office Equipment.—This account is similar in nature to the account "shop equipment," only that it applies to office furniture and fixtures, such as silent salesmen, desks, files, safes, cash register, sales register, electric fans, water coolers, stoves, etc. This account is debited and credited in a similar manner to "shop equipment." The balance represents the value of the inventory.

Sales Room Furniture and Fixtures.—When a big display room is maintained it is advisable to separate sales room furniture and fixtures from office equipment. The remarks on "shop equipment" will apply also to this account.

Buildings and Real Estate.—This account represents your investment in what is commonly termed property.

The account is debited with the cost of all property acquired, or buildings or additions added to original holdings. It is credited with the cost of the sale of any properties or parts of properties or with the value of damage done by fire, storm, etc., or with the natural depreciation of the buildings. The balance on this account will represent the cost value of buildings and real estate.

Investments.—This account ordinarily represents your investment in stocks and bonds and securities. Refer back to the remarks on Liberty bonds for those comments apply equally to this account.

Unused Insurance.—This account represents the unused part of the premiums paid for insurance.

We advocate charging insurance to expense only as it is exhausted. We, therefore, debit this account with the amount of all insurance premiums and credit it monthly with the used portion of the premiums. The balance represents an actual inventory which would take cash to replace.

Unused Rent.—The remarks on "unused insurance" apply equally here.

Unused Supplies.—The remarks on "unused insurance" also apply here.

Prepaid Interest.—This account represents an asset as it is value that

would have to be replaced at a later date. It represents an actual cash investment. In like manner the remarks on "unused insurance" will apply to this account.

These accounts—"unused or prepaid insurance," "unused or prepaid rent," "unused supplies," or "supplies on hand" and "prepaid interest"—are usually classed under one heading, "deferred charges to expense."

As they will all be written off to expense in the course of business, they are not considered current assets or tangible assets in the ordinary use of the term.

There are other assets that might be considered in this article—goodwill, contracts, patents, treasury stock, etc.—but as they are not found among the accounts of the average automotive dealer, we will take them up only by special request. If any reader of the American Garage and Auto Dealer carries any of these accounts on his books and wishes information regarding them, we will be pleased to furnish it.

New York State Helps Organize Rural Motor Truck Lines.

New York State has inaugurated a movement for the establishment of motor truck express lines through the rural sections where farmers are having trouble in having their perishable products quickly transported to market. The movement will be directed by a commission appointed late in August by Governor Smith. Former Representative Peter G. Ten Eyck of Albany is chairman.

The newly appointed commission plans to work through farmers' organizations and county and municipal officials, and all members of the commission have agreed to serve without salaries. The associates on the commission are Frederick S. Green, State Commission of Highways; Professor Boyle, of the State College of Agriculture; William E. Dana, chairman of the Council of Farms and Markets; and F. W. Fenn, secretary of the Motor Truck Committee of the National Automobile Chamber of Commerce.

Signs Guide Tourists' Cars to Doors

Great Tire and Tube Concern Sprinkles Middle Western Highways With Huge Semi-Circular Billboards Showing Road Maps of Territory, an Example that Should Be Followed by Automotive Tradesmen to Attract Business

By John Grant

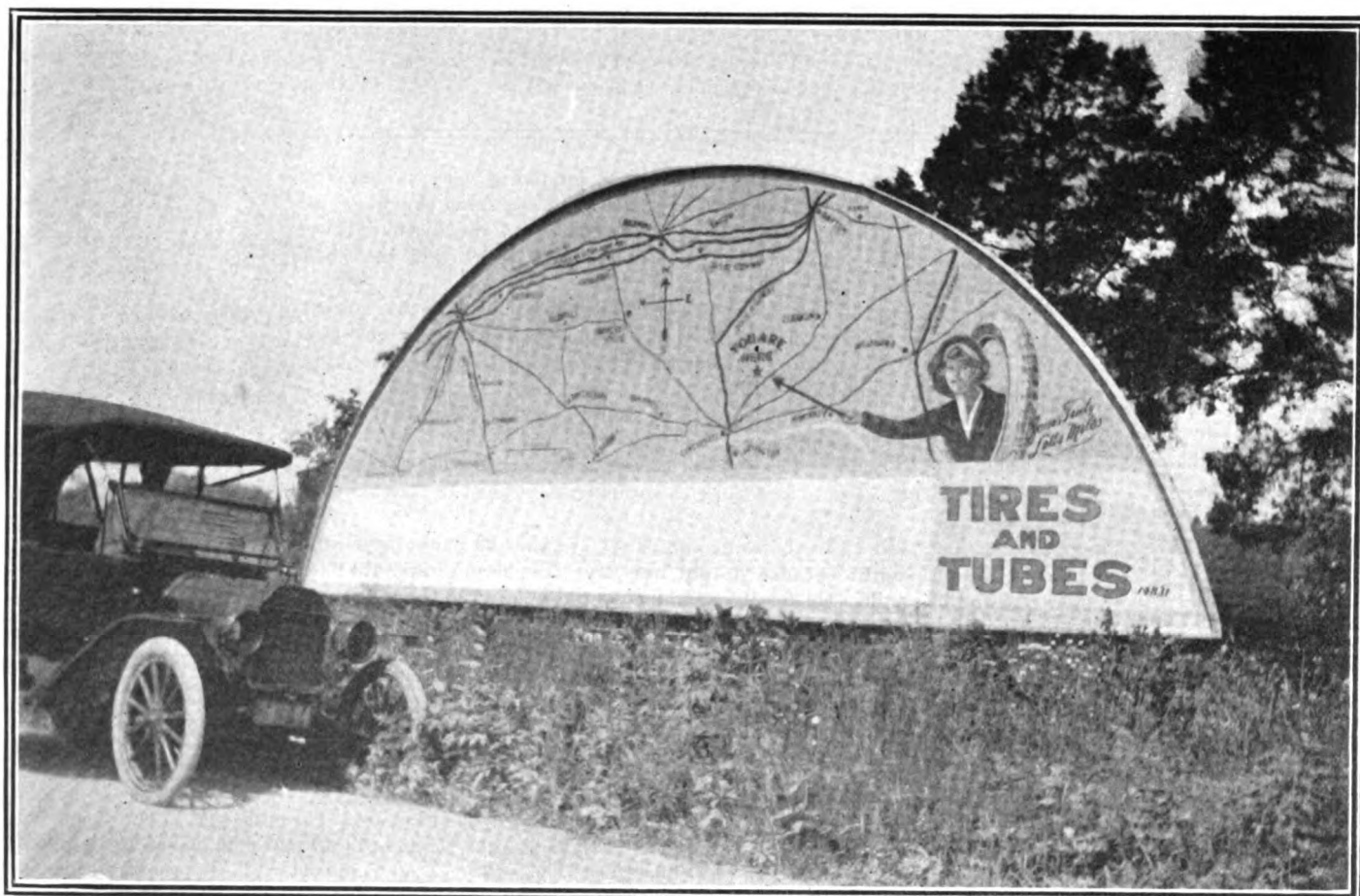
Lately competition has been growing ever keener and keener between service stations and garages in almost every country road and town street. In consequence, the owners of such repairshops, be they big or little, are looking closely into the matter of deflecting to themselves the

cently sprinkled the country-sides with signs that might very profitably be imitated by the garage-keepers, with slight improvisation as well.

These are just great semi-circular billboards, giving a roadmap of the locality. Each sign has a brilliant star, or similar device, to tell those

of gasoline, oil, or accessories will naturally follow any directions which are given on the sign.

This can be done by outlining, say in scarlet, the way from the star-marked sign site to his place by indicating the proper route upon the map. Below the map, perhaps could



Billboards with the Roadmap of Locality Are Distributed in the Mid-West by a Large Tire Concern—Star Gives the Location of Tourist, and Colored Route Outlined by the Local Garageman Shows the Direction to the Service Station.

trade of motorists, not alone of their own locality, but also those journeying from afar.

The tourist, in particular, riding hard and often with close eye to time, is always to be accounted as a good prospect for business. The tourist must be drawn to one's own service station or garage, if this can be done, no matter where he hails from.

One great tire and tube concern out in the American Mid-West has re-

who hurriedly pass by and look at it: "You are here!"

The great size of the board and the conspicuousness of the roadmap cannot help but attract the attention of the passing tourist. Many unfamiliar with the roads and not certain of their directions will stop to consult the map. In so doing they will scan the entire billboard and notice any advertisement placed there by the local garagemen, and if they are in need

be listed names of staple accessories kept in stock.

As an afterthought, the location of the nearest telephone connecting with the automotive dealer might be added. The telephone owner might be paid for the service, in some form of automotive service work.

The picture shown on this page is of such a board which is located beside the road between Monroe, Ohio, and Cincinnati.

Welding, Cutting and Brazing Practice

Methods of Preparing the Job and Doing the Work of Welding an Engine Cylinder Described—Entire Surface of Casting Coated With Mixture of Heavy Oil and Graphite—Two Ways of Finishing After the Welding Is Done

By David Baxter

There are many kinds of engine cylinders broken in various ways. Each one will present a different problem to the oxyacetylene welder; a variation in the manner of preparing, preheating, torch manipulation or other incidental.

There is usually a difference in the location of the fracture, or a variation in the extent of the damage. Or perhaps the metal is different with regard to the thickness or composition. Where the shape of the casting would make one cylinder easy to weld, considering the location of the fracture, another may be broken in such manner as will render it almost impossible to repair.

Then there may be a difference in the chemical components of the metal of two cylinders that are just alike in shape and size. This difference is readily observed by the reaction of the metal to the welding flame, although it may not be apparent on the surface. Sometimes it will weld smoothly and even with no trouble at all. Then again it will boil and blow, refusing to flow together without a lot of coaxing.

Many times these things are the fault of the torch operator who doesn't regulate and manipulate the flame

properly. But often there is a difference in the same kind of metal in different jobs unknown to him.

Once in a while the fault, or perhaps I should say the cause or origin of a crack in a cylinder, lies in the welding of it in the first place. The core may have shifted in the mold a fraction of an inch to one side or the other. This is enough to make one side of the metal thicker, which results in the thin side being weaker and therefore easily cracked, and for the same reason makes it harder to weld, due to the uneven expansion and contraction.

The things I have mentioned above and many others affect the welding of engine cylinders in a varying degree. We may deduce from this fact that to attempt a general description of the process of weld-

ing cylinders would be useless for practical purposes. Instruction that would fit one casting would probably be wrong for another of the identical kind in some respects. And, of course, there is always a difference in the temperament of the individual torch operator. One welder will often do a like job in a different manner than another torch welder, and both may be right in some respects in so far as a satisfactory weld is concerned.

Space limits forbid attempting to discuss welding engine cylinders in general. So

closed; the waterjacket was cracked entirely around the cylinder, about a third of the distance from one end. The crack being circular, was connected at its extremities.

The fracture was first cut out to form the usual V groove. This was done with a square file. The groove extended the full depth of thickness of the jacket metal, and was twice as wide at the top as this thickness. On each side of the groove the surface of the jacket was cleaned thoroughly of all paint, rust, etc., and the sur-

face was filed bare and bright about an inch on each side of the groove. These preparations were for the purpose of insuring a clean, strong weld that extended to the full depth of the fracture. No foreign matter was to be permitted to enter the melting weld, which is sometimes the case, with adverse effects, when the line of the weld is not cleaned and grooved.

To prevent any injury to the walls of the cylinder its entire surface was coated with a mixture of heavy oil and graphite, mixed to the consistency of putty and applied with the hand. Under the heading of preparation, the welder selected a medium-size tip and fitted it to the

Many of our readers no doubt have been following very closely the articles written by Mr. Baxter on welding, cutting, and brazing practice, and perhaps from time to time have not clearly understood the methods outlined or perhaps they have an individual problem with which they have had trouble in satisfactorily performing.

We would be glad to have you send us your experiences so that others may have the benefit of your knowledge. Have you any questions you would like to ask about welding or brazing? Send them in, we will be only too glad to answer them for you.

One man writing to a manufacturer of welding outfits says that he has welded several thousand castings, ranging in size from the lifter on an Atwater Kent system, and delicate gun parts, to a one-ton flywheel, and that he has had such success that to do justice to his trade he had to buy another Bermo plant.

Another man writing to the same company says that he had a hard time buying a welding outfit because he did not have the money, and that he could not obtain credit. He finally obtained an outfit on credit, mounted it on a truck and started out to do any kind of a job, whether on the street, in a house, factory or on the farm. He made such a success of his business that he had to open up a shop and he says that his greatest aid was his slogan "Service truck ready to go anywhere."

Perhaps you have had similar experiences, write and tell us about them, so that we can publish them for the benefit of the rest of our subscribers.

let us select one that has a fairly difficult fracture typically located and take up the welding of it as it was accomplished by one welder—beginning at the time the job entered the shop and following it through the steps of the welding procedure.

The first step in every welding job should be to prepare the casting for the welding flame. Some require less preparation than others, but nearly all jobs of any size are welded better and easier if certain things are done before lighting the torch. This subject is liable to lead us into deep water, too; so let us proceed with our own particular job, which is illustrated by the accompanying pictures.

Fig. 1 shows the casting prepared for welding. This cylinder weighs about 100 pounds; neither end of the bore was

torch, with an extra tip at hand so a quick change could be made in case of accidents.

The gas supplies were ascertained and regulator gauges set. Several filler rods of soft cast iron were selected and placed near the job. A pot of flux powder was replenished and set on the welding table. Tongs for turning the casting in the preheater were arranged. All of these little things were made ready in advance so there would be no interruptions after the welding started.

The next step was to arrange the casting in a preheater which consisted of a wall of fire brick built upon the welding table. Arrangements were made to have a gas burner located beneath the casting to envelope it with flame. Fig. 2 gives an idea of the preheating device.

The fire brick walls were about the height of the cylinder upon the table. This wall was made long enough to permit the casting to be rolled over as welded, but the bricks were placed close to the job in order to confine and conserve the heat. A covering of sheet asbestos was placed over the top of this oven-like structure for the purpose of protecting the torch operator and concentrating the heat.

When all was in readiness the gas burner was lighted and allowed to burn slowly a few minutes in order to cause the expansion to start slowly. Then the fire was turned on full force until the casting became red hot all over; this condition was ascertained by peeping beneath the asbestos covering at frequent intervals. There was little danger of misalignment, since

flowing into the weld until the groove was entirely filled. It was necessary, however, to remove the filler rod from the weld at frequent intervals to dip it in the flux powder, returning it to the weld as quickly as possible. The flux powder was a patent composition intended to melt the slag and to prevent the gases of the flame and the atmosphere from being absorbed by the melting weld.

The weld was made about an inch at a time along the groove in the manner described. Each inch was a part of the preceding one, however—not a series of welded spots, but one whole weld. As fast as the new metal was added it was flowed or fused with that already in the groove.

Care was taken at all times to be certain that the new metal was thoroughly mixed

position during the process or nearly so. This prevented the metal from overflowing a portion of the groove not melting. With each successive turning the cylinder was covered again and allowed to reheat where there was indication of the red heat dying.

At the end of the circle where the weld joined the starting point it was again necessary to open the solid weld and join the new metal to it.

As soon as the last joint was completed the casting was once more entirely covered with thick layers of asbestos paper and permitted to stand an hour or so before moving. The preheating fire was allowed to burn after covering the job for several minutes to bring up or equalize the expansion so that when the casting started to cool the contraction would have a chance

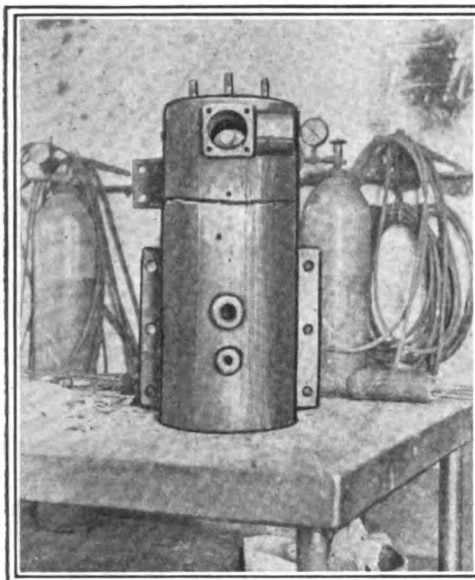


Fig. 1—Cylinder Prepared for Welding.

the inner wall or bore of the cylinder held the outer jacket rigid.

When the job reached a bright red stage—not near a white heat, remember—the welding commenced. A small portion of the asbestos paper directly over the grooved part of the casting was torn away. Here the welding flame, which had been regulated to a standard neutral, was applied.

First a small portion of the groove was melted together at the bottom by swinging the flame in short jerks sidewise along it. As soon as an inch or so was melted the filler rod was brought in contact with the flame, and melted into the melting part of the groove. The flame was in continual motion while melting the filler rod in the groove, revolving in tiny circles over the melting weld, anon up and down a short portion of the filler rod. The filler rod also was kept moving, twisting and kneading the molten metal. If little bits of slag or scum appeared in the weld, they were picked out with the filler rod or blown away with the pressure of the flame.

The chief aim during the welding process was to keep new metal continually

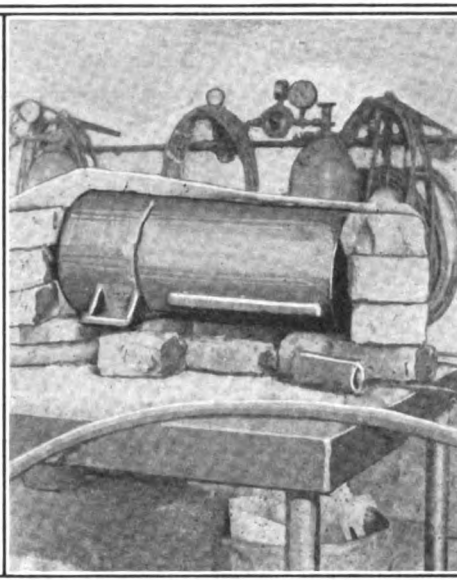


Fig. 2—Cylinder Ready for Pre-Heating.

with the sides of the weld as well as the bottom. At no time was the melting filler allowed to drip into the groove, because such a proceeding causes poorly connected spots wherever it is done, although they may not be apparent at the time. The metal should be flowed in always; if there are any spots in doubt, they should be stirred with the rod under the flame. When the scum gathers on the weld it should be blown or wiped toward the outer sides of the weld where it will collect in a black cindery line.

As soon as the first arc of the fracture was welded full the torch was laid aside and with the aid of the tongs the cylinder was rolled over in order to bring a new section of the groove upward. Then, after re-covering the casting, this new section was welded the same way as the first.

The operator should use special care to see that the new section is thoroughly mixed with that part already welded; there should be no dividing cold layer.

The groove entirely around the cylinder was welded a section at a time by turning the casting as fast as the weld progressed. Each section welded was in a horizontal

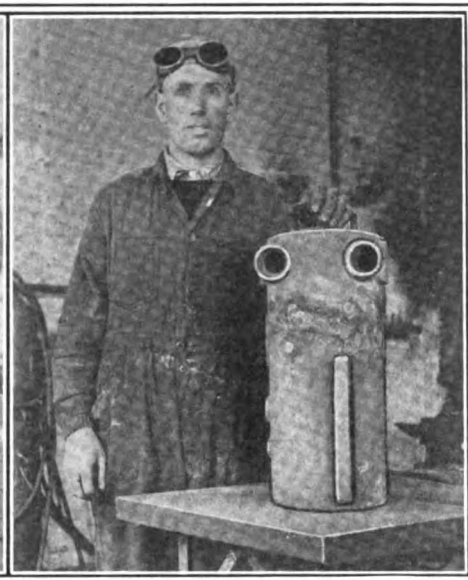


Fig. 3—Welded Cylinder Ready for Grinding.

to act evenly. No cold air should strike a welded cylinder until it is cool enough that it will not fry a tiny drop of water.

Two methods were employed in the "finishing" or machining of this cylinder, one being known as the "hot finishing," where the flame pressure and filler rod arc manipulated to blow and scrape off the slag and rough spots, or the welder can use a special scraper with good effect while the casting is still red hot. The slag will come off easily then, while it will adhere firmly after the job is cold.

The other method is called cold finishing and is accomplished with files or grinders. The cylinder being round made this easy.

Fig. 3 shows the welded cylinder before grinding. The rough surface was all ground off. Then after testing for leaks the job was ready for service again.

The method as described is not arbitrary, but is a safe one to adopt. The instructions may be varied slightly to suit shop conditions and equipment and yet produce good results. As with everything else, these instructions should be tempered with a little judgment on the part of the individual torch operator.

Amendment to Car Seizure Bill

The National Automobile Dealers' Association Asks That Conditional Bills of Sale and Mortgages Held by the Dealer on Cars Should Be Respected—This Amendment Will Save Dealers Thousands of Dollars

Automobile dealers will be saved hundreds of cars and thousands of dollars as the result of an amendment to the Volstead prohibition bill by the Senate Judiciary Committee at the request of the National Automobile Dealers' Association. The association's representations, that conditional bills of sale and mortgages held by the dealer on cars should be respected to protect the equity of the dealer were adopted by the committee and there is little doubt but that this feature will be added to the bill in its final form.

The Volstead bill is the act to enforce constitutional prohibition and will be effective after January 20, 1920. In the first draft of bills as presented a car was subject to confiscation for carrying liquor, no mention being made of the rights of an innocent owner of the vehicle. Under the amendment obtained by the National Automobile Dealers' Association, if a car is seized the dealer may appear as a claimant and if he proves that the car was wrongfully used without his knowledge, he may have his rights in the car protected. If the car is one which is used without his consent his rights are protected.

The amendments were obtained as a result of conferences between Harry G. Moock, N. A. D. A. business manager; C. A. Vane, St. Louis attorney, and Walter B. Guy, Washington attorney for the association. Mr. Guy presented the case of the dealers to the Senate Judiciary Committee.

In securing these rights the dealer association obtained the consent of the committee for the claimant to furnish a corporate bond for the value of the car pending disposition of the hearing. First proposals of the committee were to require a personal surety bond. When it was explained that thousands of dealers furnished corporate bonds for all their commercial transactions and that it would in-

convenience them greatly to go outside their regular channels to obtain personal bonds the bill was amended to allow the court in its discretion to adjudge what would be a "sufficient" bond. In the event that the officer refuses unreasonably to accept the bond offered mandamus is available to compel acceptance.

Another point clarified was that the court may in its discretion designate what information it shall consider sufficient as showing cause why a seized automobile should not be sold. The committee was of the opinion that the proper affidavits would furnish a sufficient protection.

Amplification was obtained of the method of giving notice of the seizure and proposed sale of cars. Section 26 of the bill provided that if no one shall be found claiming ownership of the seized automobile, the taking of the same with a description thereof, shall be advertised in some newspaper published in the city or county where taken, or if there be no newspaper published in such city or county in a newspaper having circulation in the county, once a week for two weeks and by handbills posted in three public places near the place of seizure, and if no claimant shall appear within ten days after the last publication of the advertisement the property shall be sold."

The association obtained the further amendments of this clause by having inserted after "Once a week for two weeks and before and by having handbills," the following provision, "a copy of said advertisement to be mailed to the manufacturer of said vehicle if known." This provision it is felt will enable the manufacturers to notify the dealer of the seizure of the car and if sold on a conditional bill of sale, to allow him to appear as claimant.

Mr. Guy stated on behalf of the association that it was the dealers' intention to assist the authorities in

every way possible to enforce the law and that the association wanted nothing read into the bill which would enable a dealer to connive with an intending law breaker. The dealer must prove to the satisfaction of the court that he has acted in good faith and that he has had no knowledge of the wrongdoing and that he did not act so negligently as to permit illegal uses.

The association feels that no such conditions will arise under the constitutional prohibition as to subject dealers to loss of cars seized as now prevails under a statute which has been interpreted in the Southern U. S. Circuit Courts to make the dealer the guarantor of the integrity of every man to whom he sells an automobile.

Changes in Standard Sizes of British Pneumatic Tires.

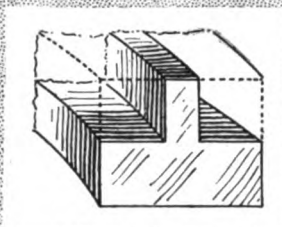
Revolutionary action has been taken by British tire manufacturers in reducing the number of standard sizes of pneumatic tires to 10 and of standard rims to five. These standard sizes only will be supplied for new equipment, but other sizes will be furnished in limited numbers for replacement purposes. That this decision is a drastic one is evident when it is considered that formerly there were approximately 50 sizes listed.

There are two features of interest in connection with the new standard sizes. One of these is the apparent disappearance of the 90 mm. tire, the most popular of all in pre-war days. The other is the substitution of inches for millimeters in what are now the 30 by 3½ and the 31 by 4 sizes.

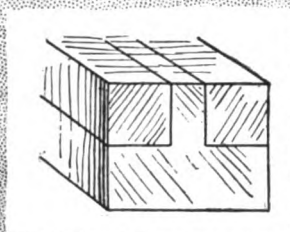
The latter illustrates the influence of the Ford, inch-tire replacements having become sufficiently profitable to the tire makers to cause them to install the necessary molds and equipment. All the new tires are of ordinary clincher type and are used, as is the custom in Europe, with security bolts.

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1



2

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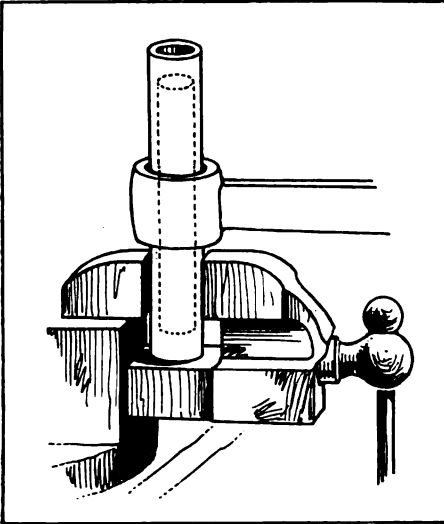
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Practical Hints for Shop Mechanics

Conducted by E. C. Pohlmann

Taking Up Wear on Bushings.

Get two pieces of old gas pipe, each about six inches long with inside and outside diameters as nearly the same as that of the bronze bushing. Then place the wrist pin



To Take Up Wear on Bushings.

in the bushing and with one end of the connecting rod resting on the piece of pipe clamped in the vice strike the other end a sharp blow with a two or three-pound hammer. Bronze is soft, will readily compress and take up the wear sufficiently to withstand another year of hard service. If the bushing binds, it will have to be scraped a little and simply worked in.

* * *

Soldering Wires into Lugs.

In soldering wires into lugs it is first necessary to tin the recess in the lug by heating and applying flux and solder.

The end of the wire should be similarly tinned. By applying heat to the lug and partly filling it with solder, the process may be completed by plugging the tinned wire-end into the lug and cooling it while holding it in position.

Only enough solder should be placed in the lug to fill the space around the wire completely. If more is used, it will overflow and adhere to the outside of the lug unless this be first covered with a coating of light oil of high flash-point.—M. W., London.

* * *

Danger of Water in Oil.

If water is permitted to remain in lubricating oil, there is danger of its collecting at some point and freezing, which will, of course, result in some part breaking. During the cold months it is advisable to drain the oil from the crankcase every 500 miles. When there is little chance of the water freezing, it should be watched nevertheless. A crack in the cylinder wall will al-

low water to escape from the water jacket to the combustion chamber, or the water may collect after moisture in the burnt gases has condensed, and leak past the piston. Suggestions of this kind will soon be in order for mechanics and garage owners to give to their customers.—G. L. S.

* * *

Use of Heavier Oil.

It may be well for a mechanic to keep in mind the fact that the engine of a car that has been operated for two or three years will give better power if heavier oil than at first intended for it is used.

* * *

Cut-out Connection.

The usual method practised when installing cut-outs, where the cut-out pedal is on the floor board, and the cord which connects the pedal to the cut-out is permanently fastened, prevents easy removal of the floor

ONE DOLLAR EACH!

Each shop hint and illustration printed in this department means one dollar or a renewal of subscription to the person sending it in. You have some time or labor saving ideas which you know are thoroughly practical. Tell us about them in your own language. Write out a brief description, with a sketch if necessary, that is all we require. We will fix up the sketch for reproduction, a finished drawing is not needed, simply a free-hand sketch. You get a dollar if the idea is worth publishing.

board when necessary for making an inspection. This can be avoided by using a common harness snap to make this connection, thereby permitting the floor board to be removed without difficulty.—G. L. S.

* * *

Drills of Extra Length.

Where drills must be used in out-of-the-way places—fan pulley, starting clutch jaw, etc., a drill of extra length will be found a convenience. This can easily be made with the aid of the oxy-acetylene torch, by welding short lengths of drills to the drill rod.

* * *

Clutch Cleaner.

If difficulty is experienced in washing out the clutch of a Paige car the operation can be facilitated with the use of a simply constructed device: Use a one quart can after removing the top, and solder a one-eighth inch copper tube to

the bottom. This tube should also be fitted with a valve six or eight inches from the bottom of the can. Remove the one-eighth inch plug from the housing, through which opening the copper tube should be passed. The can should be filled with a mixture of one part kerosene to two parts cylinder oil, which is the most satisfactory kind for passing through the clutch plate.

* * *

Enamel Polish.

A very good polish for enamel surfaces consists of the following:

Oil of citranilla, 3 oz.

Oil of cedar, 1½ oz.

Oil of paraffin, 1 pt.

Turpentine, 1 gal.

* * *

Closing Cracks in Castings.

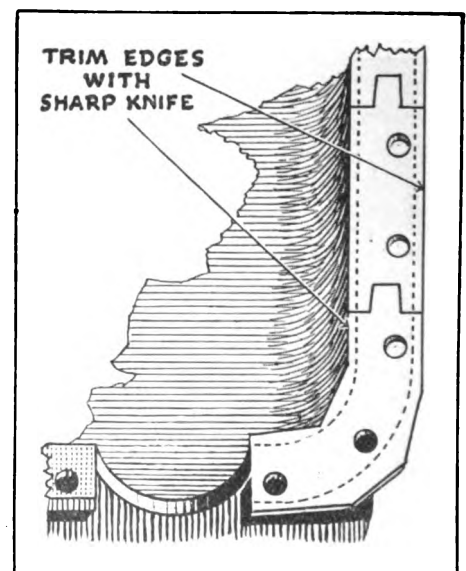
A solution of copper sulphate will close cracks in water jackets. It produces a deposit of pure copper which will gradually fill the crack. This solution should be placed in the cooling system and left until the leak disappears.

* * *

Stopping Crankcase Oil Leaks.

Oil leaks from the crankcase are a source of nuisance as well as expensive. These leaks are caused as a rule by worn threads on the studs or in the cylinder base which prevents the crankcase from being securely fastened, and also by worn gaskets.

To prevent these leaks remove the old



Making a Crankcase Gasket.

gasket and scrape the surfaces clean. Apply a thin coat of shellac, cut strips of thin cardboard and shellac these to the crankcase dovetailing one into the other (see illustration) and clamp them until dry.



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Illustrated above—is 10x14 inches—baked enamel on steel. Cannot be bought, but is furnished FREE with every CURTIS Garage Air Compressor—and cannot be had in any other way.

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Display a CURTIS "FREE AIR" SIGN above your door—it inspires confidence and will help build your business. Motorists are looking for this familiar CURTIS slogan—because they know oil rots tires—and that a CURTIS Air Compressor furnishes AIR FREE FROM OIL, which means fewer blowouts, greater tire mileage and less repairs. The CURTIS is the ONLY Garage Air Compressor with the controlled splash oiling system that eliminates all danger of forcing oil into the air line.

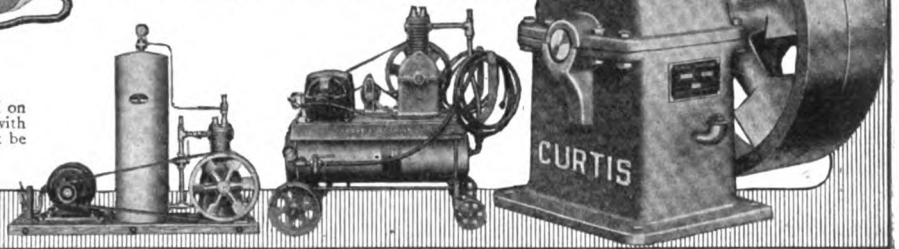
CURTIS AIR FREE FROM OIL

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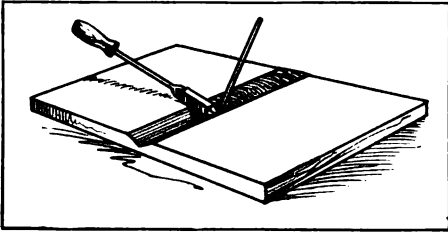
When they become glued, trim the edges with a sharp knife, and put the crankcase in place.

Replace the worn stud bolts with ordinary machine bolts wherever possible. If this cannot be done it is best to retap the holes and get new stud bolts. Wrap twine coated with shellac around studs above the lock washers to prevent leaks around the bolts.

* * *

Aluminum Soldering.

Soldering aluminum is somewhat difficult unless certain preparations are made:



Method of Soldering Aluminum.

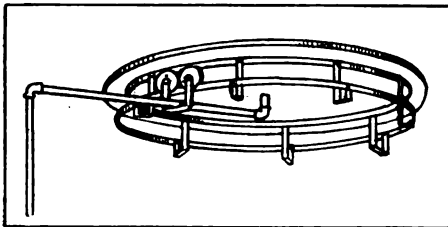
First, cut away both sides of the crack or both edges of the parts to be soldered until a V-shaped groove is formed. Now heat this groove until it is fairly hot. Then both sides of the groove are cleaned with a wire brush. Then rub the heated end of a bar of solder along the V until bits of it cling to the sides of it. Aluminum solder is required.

Now brush the entire groove thoroughly again to form a thin skin of solder on its surface. After this is done, again heat the groove until hot enough to melt the solder, working it in with a soldering copper. See illustration. Fill the groove to overflowing and smooth it down with the copper. As soon as the solder starts to set press it flat and even with a hammer handle or other convenient piece of hard wood.—D. B., Kansas.

* * *

Vehicle Washer.

A convenient and practical kink for washing automobiles can be made of a door track together with a few odds and ends. Bend the door track into a circle and bolt to a framework which can be built up from a few lengths of boards. A carrier such as is used for holding the door can be put into use as a support for the cross pipe. A



Vehicle Washer Made of Odds and Ends.

rubber hose should then be connected with the cross pipe. A packing gland will allow the cross pipe to be carried around the circle without any water leaking out, thereby affording convenience in reaching all parts of the car.

Pneumatic Head Rest.

An old inner tube can be utilized in making a really comfortable head cushion for a creeper. Cut out about a foot of the section which contains the valve, and vulcanize the ends so that it can be inflated. The cushion should be so placed that the valve stem points downward.

* * *

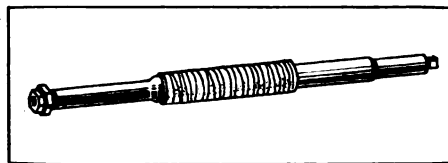
Keeping Grease from Brakes.

When new felt washers are put on the rear axles to prevent grease from working onto the brakes and the grease still works by it can be effectively prevented by wrapping the axle shaft with strips of old cloth and fastening them with strong wrapping cord as shown in the illustration. Be sure that you tie the cloth securely so that it can't unwrap.—J. C. R., Erie, Pa.

* * *

Method of Drilling Hole True.

It has no doubt been the experience of every mechanic when drilling a hole "dead true," that is, the exact place where it is supposed to be drilled, to discover that this is not so easily done as may be commonly believed; that with the exact center of the hole located and a deep center made with a punch, and the point of the drill properly started in the center it might properly be supposed that the operation would consist merely of feeding down the drill. The fact has no doubt been discovered, however, that as a rule the drill will not hold a true



Keeping Grease from Brakes.

course; that it will, on the contrary, work away from the center laid out for it, and the extent of the error will be found to depend upon the size of the drill—the larger the drill the greater the error.

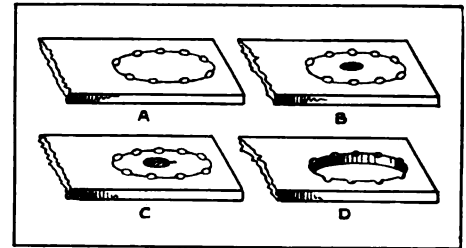
As long as the cutting edges of the drill are only partly below the surface of the metal there will be a tendency to edge away from the center, but if the drill used is the "twist" type, it will run true as soon as the cutting edges are below the surface of the metal. If the drill used is either a flat, or a lipped drill it will have a tendency to sidle away from the center no matter in what position.

In case the surface of the piece to be drilled will not show scratched marks distinctly, it should be rubbed with a chalk preparation, after which the center is located and marked with a prick-punch. A circle representing the size of the hole to be drilled can be described with the use of a compass, using the prick-punch mark as a center.

In order to locate precisely the outer edge of the hole, a ring of marks is made on the circle with the prick-punch, being careful that the point of the punch

is exactly on the line each time. See illustration A. The center mark should then be made sufficiently large with the use of a bigger punch so as to take the point of the drill.

The drill should now be started in the center until a depression is made of about half the diameter of the ring of punch marks. Withdraw the drill and note whether or not the edges of the cut are concentric with the prick-punch ring. If the edges are not concentric (see illustration



Steps in Drilling a Hole True.

tion B) then it will be necessary to withdraw the drill, and proceed by cutting a very narrow groove (see illustration C) down the side of the drill-cut located farthest from the outer ring. This groove can be made with a narrow, round-nosed chisel, extending from the edge of the drill-cut to the center.

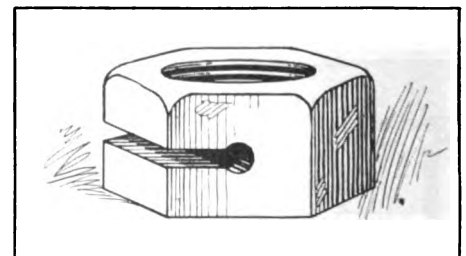
Repeat the process of drilling a few revolutions, and withdrawing the drill as soon as the chisel mark is cut away, and cutting a new groove if found necessary until the cut has very nearly reached the ring. At this point make another inspection so as to note whether or not the drill is running true. When exactly right the punch marks originally made in the ring will be cut in two (see illustration D) as the drill sinks in.

As to just when the drawing should be done, and just how the groove should be cut, can be learned to a stage of perfection only through experience by the operator. One's first impression may be that this process is a lengthy one, but in reality can be operated quickly after a very little practice.—G. L. S., Chicago.

* * *

Novel Method of Locking Nuts.

A self-locking nut is formed with a transverse or oblique slot extending into



Self-locking Nut.

the threaded bore. See illustration. When the nut is screwed down the slot tends to close binding the nut on to the bolt. The end of the slot is rounded as shown or in square.

AIR!



An ideal little outfit for the private garage and the small public garage!

The illustration above shows all there is to it—and you'll be surprised how wonderfully it does the job! All the air you need—when you need it—without bother or fuss. No tank needed at all.

You can lift it about easily—weighs only 35 pounds. Just attach to electric light plug—simple, durable, lasting—just exactly what you want for your garage. Thousands of small public garages find it all the air equipment they need. Private owners declare it solves their air problem perfectly.

Gives pressure up to 100 pounds, and will provide 2.61 cubic feet of air a minute.

Air is free from oil and grease. In fact, this little compressor will give you satisfactory service and you have the worth while economy in first cost and operation.

It comes complete with motor, cable, gauge and connections, ready to run—and to keep running.

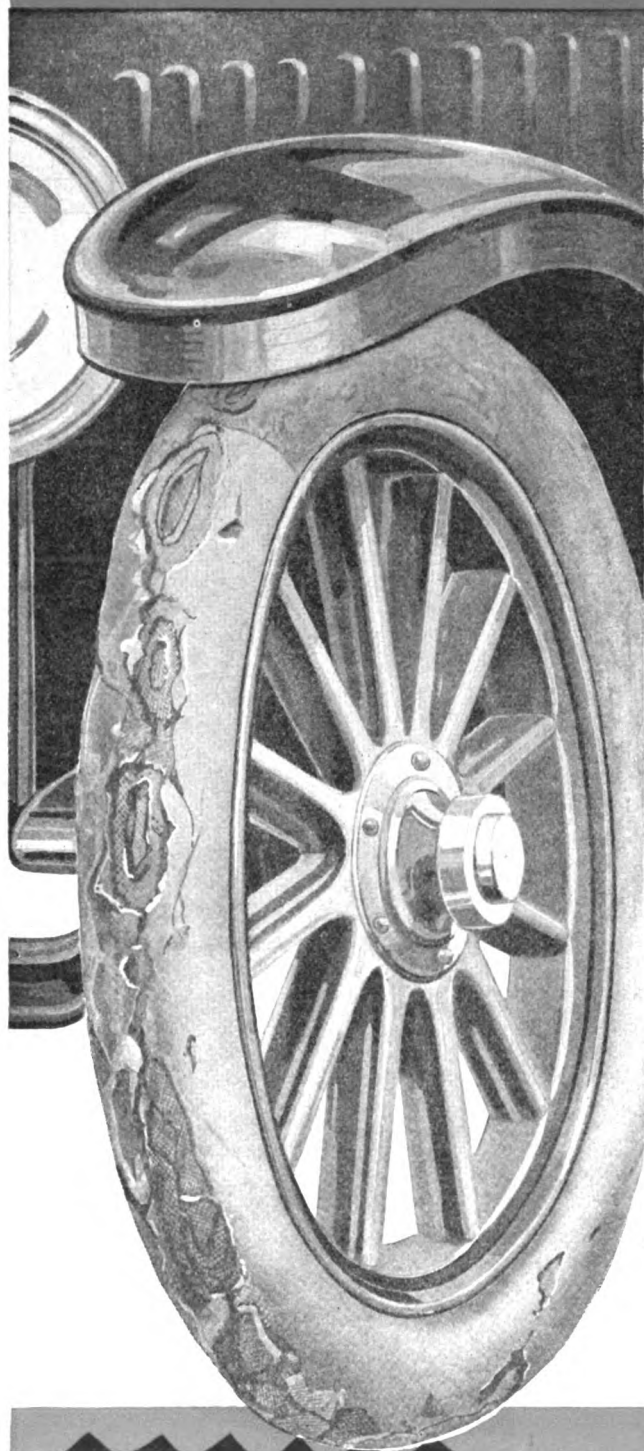
Further information if you'll write.

Nº 10

The AU-TO Compressor Co., Wilmington, Ohio

AU-TO Compressor

MAKE YOUR OLD TIRES AS GOOD AS NEW



The Miller AD-ON-A-TIRE is the Only Perfected Tire Remiler

FOR years dealers and motor car owners have been experimenting with many makes of tire remilers. They tried first one and then another.

Yet until the Miller AD-ON-A-TIRE came none offered a sufficient insurance of extra mileage to warrant the repair expense.

As a result dealers hesitated to recommend remiling. And motor car owners preferred to run on their tires after the tread had worn off rather than depend on makeshift repairs. This meant lost business for dealers, and an enormous tire waste for motor car owners.

Saves 75 Per Cent

The Miller AD-ON-A-TIRE has ended all this. It is the perfected type. With this New-Day tire remiler motorists can now save 75 per cent of their tire value. *Dealers can guarantee this.*

The Miller AD-ON-A-TIRE is built of tough, buoyant rubber. It has several layers of fabric, breaker strip, tread and side wall *which completely cover the tire and clinch under the rim.*

Once on it becomes an integral part of the tire. And the AD-ON-A-TIRE has the famous Miller Geared-to-the-Road Tread.

A Matchless Opportunity

Never has such a wonderful opportunity been offered dealers. Once people know that you sell this perfected tire remiler and know what it is, and what it does, you have a never ending stream of business.

Read on the next page. Then send in the coupon and get your share of this wonderful business.

Miller AD-ON

THE ONLY REAL TIRE REMILER ON THE MARKET

No Business Today Offers Dealers Such Guaranteed Sure Returns

EVERYWHERE Miller AD-ON-A-TIRE Dealers are making phenomenal sales records. We have not a single account on our books that is not showing remarkable monthly gains.

Here are the reasons why:

- 1—Motor car owners know that there is an enormous tire waste when the tire is run on the carcass after the tread is worn off. And that make-shift repairs are unprofitable.
- 2—The Miller AD-ON-A-TIRE is the only REAL tire remiler. It is the only remiler that satisfactorily solves the lower tire cost per mile problem. Motorists are quick to see the remarkable savings it makes for them. And regardless of the make of tires they originally preferred, *all select the Miller AD-ON-A-TIRE in preference to any other tire remiler.*

When it is considered that every car in your locality will use from 4 to 6 AD-ON-A-TIRES this year, the attractive demand for this new-day tire remiler can be appreciated. *Absolutely no additional equipment is required.*

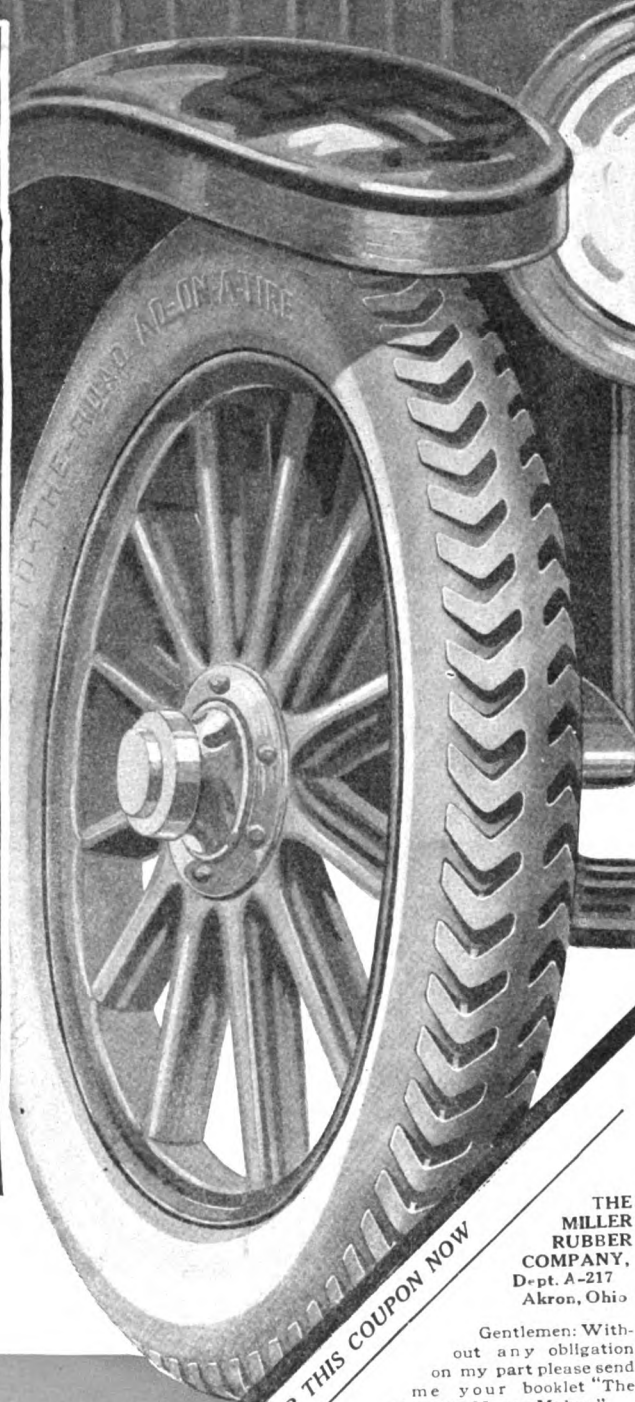
- 3—We give our dealers a most complete agency proposition—attractive profits, and complete sales and advertising assistance, such as letter-heads, newspaper advertisements, folders, wall hangers, price-lists, etc. Nothing that will enable our dealers to acquaint the motor car owners in their territory with AD-ON-A-TIRE facts has been overlooked. * * * *

These are the reasons for our present dealers' success. And they will be the reasons for YOUR success. Clip the coupon NOW for our folder, the New Big Money Maker. It will bring all the interesting facts to you.

THE MILLER RUBBER CO.

Dept. A-217, Akron, Ohio

Makers of Miller Uniform
Tires and Tubes,
Accessories
and Repair
Materials



CLIP THIS COUPON NOW

THE
MILLER
RUBBER
COMPANY,
Dept. A-217
Akron, Ohio

Gentlemen: Without any obligation on my part please send me your booklet "The New Big Money Maker."

Your Name.....

City.....State.....

I sell the following tires.....

I do only tire repair work.....

AD-ON-A-TIRE

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

How to Make the Shop Profitable

Customers of Central Service Stations and Repair Shops Claim that They Can Have Work Done and Buy Accessories Cheaper in Chicago—Bill's Curiosity Aroused, so He and the Manager Drive to City on Investigation Tour

By E. B. Hinrichsen

"How are customers' kicks coming, Bill?" asked Mr. Brown one day, referring to a plan they were trying out of having Bill personally investigate every complaint on service, no matter how trivial.

"Oh, so so," answered Bill. "I have been running them down, but most of them seem to be without much cause. Our chaps are doing good work and are really trying. What I hear most from the customers is the way other shops do business. You know Willetts, don't you? Drives a Buick. Well, he came in here for a new bumper a few days ago and did not take it because the accessory man wanted to charge him for putting it on. At the price we sell them for, it could not be done without losing money. Willetts showed up here yesterday with a new bumper on. Claims he got it put on in Chicago when he was there and that there was no extra charge. It can't be done with that make of bumper. I got the name of the concern he bought it from and am going to ask them how they do it the next time I go to Chicago.

"Then we get kicks on service. First this man, and then another says he got a job done cheaper and quicker than we could do it. The deuce of it is that they are talking about out-of-town places. Lots of our folks drive to Chicago every week or so and some of them tell me how places there are run. I get names and addresses every time. If what they say is true, Chicago shops must be running for the fun of the thing or else there's something wrong with our system. I'm thinking of writing a few of them and see if I can get an idea or two."

"I think a better plan would be for you to investigate personally, Bill. Things are quiet here and a trip would do you good. In fact, a trip would do us both good. Suppose we both arrange matters so we can get away next week. We can take a car and drive around a bit. Maybe we can pick up a few pointers."

"Listens good to me, maybe I can pick up a good man or so. I need 'em badly."

Bill told Mr. Brown that he would furnish the car for the trip and for some days was very busy. On the day that they started he appeared with a fairly good-looking vehicle, but no one could guess what the make was. The radiator was of a type that is used on several moderate-priced cars and bore no nameplate. The hubcaps were perfectly plain. The motor was of a popular make, but the transmission was one which seldom if ever

was associated with that make of engine. It was the same all the way through. You might think you had identified it by the body, but then the rear axle would not agree. It was a puzzle and Bill refused to reply to the many questions fired at him by the persons who were interested. Mr. Brown climbed in and they started.

"Seems to run pretty well, Bill," remarked Mr. Brown after a few miles. He had purposely not asked any questions, as he knew Bill had something up his sleeve and would tell it quicker if left alone.

"Think so?" asked Bill, and the engine immediately began to miss and finally settled down on three cylinders—it was a four-cylinder car. "There's a case of trouble I can put in any time and it will take a man with brains to find it. Everything about that cylinder will test O. K., but you can't make it hit. That's only one of several cases I can put in. I'm going to see if I can find any good mechanics on this trip." In the meantime the missing cylinder was working again and the motor ran as smoothly as ever. "Assembled the 'bus' ourselves," went on Bill. "There is a little of most every make of car in it. Hope it holds together. It's mostly junk." And Bill grinned as he hit a bad place hard and watched Mr. Brown grab the top iron.

Their first stopping place was a good-looking garage on the west end of the city. As they drove up in front of the place a pleasant-looking man stepped out and asked them if he could do anything for them. Bill made some inquiries as to the best way to get to a certain point and his questions were quickly and pleasantly answered. They then asked for a quart of oil and what kind he carried. He named a brand that was Bill's pet abomination, so they called the oil deal off.

They asked him how business was, but he did not know, as he had only bought the place the day before and had taken possession that morning.

"Thought so," grunted Bill to Mr. Brown. "He looks green. Let's look the place over."

The new owner gladly showed them around. The place was clean and orderly, there were a few cars on the floor, but no work going on. The owner seemed to be alone.

"You don't know of a good man looking for a job, do you?" he asked. "The man that worked here quit when I bought this place and I need help."

"A man!" snorted Bill aside. "This

joint needs about five to pay expenses. He's a nice chap all right and I feel sorry for him. Let's look over his supplies."

They looked into the office, they looked at the stockroom, in fact, they looked everywhere, and Bill grew more and more disgusted. He finally bought a spark plug and they departed.

As soon as they were out of sight around the corner Bill stopped and pulling out the plug he had bought, handed it to Mr. Brown without a word. Mr. Brown looked it over. To him a spark plug was a spark plug and this looked very much like any other. He handed it back with a question in his eyes.

"Rotten!" said Bill. "They make 'em to sting suckers with. The porcelain will break in ten minutes, there are no gaskets to prevent leakage and there's no space left for carbon deposits. Good-bye, fake," and he threw it away.

"Poor devil!" he went on. "He seems to be a nice chap, but somebody has unloaded a lemon on him. The rest of his stuff is just as bad as the plugs. Chances are that the location is bad, too. We'll stop on our way back and see how he feels."

After lunch they drove down automobile row, stopping first at the supply house of bumper fame. There were three or four salesmen on the floor, but it was some little time before one came to wait on them. This was excusable, however, as business was rather brisk. Bill asked for a bumper, naming the same kind that Willetts had purchased. The price asked was a few cents higher than their own place sold them for, but the salesman agreed to put it on without extra charge. Bill was puzzled. How could they do it? It was not a new place and they ought to know what they were doing. Something was wrong. Mr. Brown, who had been looking around, asked about tires.

"Oh, yes," said the salesman, "as it happens, I can fix you up nicely on casings. We just received a shipment from our factory," and he pointed to a well-filled tire rack.

"What make?" asked Mr. Brown.

"Our own," answered the salesman. "The best tire that can be made. The price is a little higher than standard, but the tires are worth it."

Bill looked one over. He was not exactly a tire expert, but he swore a man would have to chase him a long way to give him one of those. They only bought the bumper and while it was being put on looked at neighboring window displays.

Would you like this money, Mr. Garage Man?

Of course, you want to make more money by increasing your business.

A source of big revenue for garages is rapidly developing in the steadily increasing use of Electrical Starting and Lighting Equipment. This equipment requires installation, repairs, adjustments, renewals, etc.

The demand for this service has grown so that you must now prepare to meet it, or lose your trade to your more enterprising competitor. Practically all first-class garages now are fully equipped to handle this trade.

Here is a complete Electrical Testing Equipment which you can install at small cost and which will furnish you a full and permanent equipment. It will enable you to meet all competition in the electrical line, and more than hold your own.

Weston

Model 280

GARAGE TESTING INSTRUMENT

In reality, this Instrument is the equivalent of six separate Measuring Instruments of different ranges. It provides a means of making any tests that are necessary on electrical starting and lighting systems. It enables you to locate electrical troubles quickly and apply the proper treatment to remedy them.



This Instrument is extremely accurate, durable and serviceable. Its possession will place you a long way ahead of your competition not so equipped.

**Prompt Shipments
from Stock—**

Order at Once

**Weston Electrical Instrument Co.
30 Weston Avenue, Newark, N. J.**

| | | | |
|-------------|--------------|---------------|-------------|
| New York | Philadelphia | Denver | Toronto |
| Buffalo | Pittsburgh | San Francisco | Montreal |
| Cleveland | Richmond | Detroit | Vancouver |
| Cincinnati | Chicago | Seattle | Halifax |
| Boston | St. Louis | Miami, Fla. | Havana |
| New Orleans | Minneapolis | Winnipeg | Mexico City |

"Do you see it, Bill?" asked Mr. Brown as they drove away after again declining the salesman's urgent invitation to buy a tire. "On standard goods they take a little loss and more than make it up on the shoddy stuff. They probably have a hundred different articles of their own make."

"I guess so," said Bill. "We stung them on the bumper, but I imagine it doesn't often happen that way. I would have bought that tire if I had not been able to see that it was second-rate. Wait till I see Willetts. I hope he bought four of 'em."

Bill now stopped and raised the floor boards in the rear of the car. He did something with a couple of wrenches and they started again. Immediately from the back axle or somewhere came the most awful sounds, screeches, grinds, howls, clatters, bangs and cracks. Mr. Brown nearly jumped out of his seat and pedestrians stopped to look and listen. Bill drew up before a door marked "Service Dept."

The door was open and a man was sitting near it with his chair tilted back against the wall.

"Can I get some work done?" Bill asked him.

"Dunno," replied the individual, without moving. "Have to see the service manager."

"Well, where is he?" asked Bill rather impatiently.

"He went out a little while ago. Guess he'll be back after a bit."

"But can't anybody else take care of me? I'm from out of town and am in a hurry. I want to start home as soon as possible."

"Nope; you'll have to wait. Here he is now," he said, as a car drew up.

Bill told the service manager his troubles. The man got in and started the car. After a few feet he stopped it.

"Your transmission is shot," he remarked. "It will have to be taken down and rebuilt. The transmissions are weak in this make of car. Probably take three or four days, maybe a week if we have to order or make any parts. Good car except for the transmission. We have lots of them here for that kind of trouble."

"You infernal liar!" yelled Bill, and grabbing Mr. Brown, he jumped into the car and was gone with a crash and rattle, leaving the service manager staring after them—the most surprised man on the row."

Bill removed his case of trouble and as they were tired they decided to delay investigating till the next day. Mr. Brown thought it would be pleasant to drive out on the north side and put up at a hotel

there for the night, as it would be cooler and quieter.

When they reached the neighborhood of their hotel, they stopped at a good-looking garage and asked if they could put up for the night. The colored gentleman in charge of the place was rather doubtful about it when he discovered that they did not want the car washed or greased or polished and no oil or gasoline, but he finally condescended to point out a vacant place for Bill to back into. Bill made several efforts and would probably have made it if his colored friend had not insisted on giving him directions, so Bill lost his patience.

"Haven't you got a space easier to get into than this?" he demanded.

"You don't have to get in there if you don't want to," was the reply.

"You're damned right I don't," howled Bill, and shot the car out of the door like a scared cat. The doorman at the famous—and very high-priced—hotel where they stopped took charge of the car and called some one who drove it away to be returned in the morning.

Bill was not interested in where it went. He wanted some supper and then a bed. He was all in. They turned in early, intending to continue their explorations on the following day.

Whole Town Christens Truck Plant

Five Banks and Fifty Stores Closed Up While Bankers and Merchants Helped Celebrate the Opening of an Indiana County's Greatest Industry—Flour-mill Owner Proudly Drives the Plant's First Vehicle in the Procession

By R. R. Shuman

Sullivan county, Indiana, that boasts of the biggest silo in the world, and of winning countless prizes for blooded live stock and superlative farm products, recently celebrated the opening of its greatest industry.

"Down by the railroad station" in Sullivan, the county seat, a new brick building stands, with a big sign announcing:

MUTUAL

America's Greatest Truck.

And this building was recently the scene of a "christening" that has few parallels in American industry.

The whole town closed its doors for the afternoon—five prosperous banks and some fifty retail grocery, drug, hardware, shoe, clothing and other stores—every store in town—closed up tighter than on Sundays.

The local band, headed by a fat little drum major, struck up "Hail Columbia," and the procession started in the "square" beside the picturesque old brick court house. Following it was the first Mutual Truck ever built, chauffeured by its purchaser, a flour miller from across the line in Illinois, who had been hauling grain and flour with it for 13 months through all kinds of

weather and over all kinds of country roads.

And following the truck were some 300 automobiles, those conveying officers and directors of the company in the lead, fol-



Ways of Putting Things Over Always Interest Mr. Shuman.

lowed by the "orators of the day." The automobiles in the parade represented citizens from every corner of the county—and anybody who ever doubted the wealth and prosperity of Sullivan county needed only to size up the makes and purchase-price of those automobiles to satisfy himself that he was looking at "real money."

Or, if the machines themselves needed any further confirmation, he could get that from the way in which the women folk in them kept abreast of New York and Chicago fashions.

The procession wound up at the truck factory, in which seats for 1,500 on the new cement floor were quickly occupied. A speaker's platform at one end was crowded with officers and directors of the company—and the speakers.

A prominent attorney—they called him "Judge"—presided. The town poet read an epic entitled "Our New Enterprise"; a local banker told the story of the birth of the enterprise, and how Robert E. Petrie, its president and founder, had won the confidence of all of the citizens of the county during two years of patient, earnest, business-like propaganda on behalf of his

ZELNICKER
Ever-Tyte

**The Piston Ring
for All Engines**



Bonded to Satisfy

Reprinted here is a Piston Ring guaranty bond that means what it says. Read it—every word—NOW. You never saw one offering wider security.

With ZELNICKER *Ever-Tyte* Piston Rings you get more power on less fuel and oil. Its six point circular expansion makes absolute all-round contact with the cylinder wall. By means of Zelnicker's Patented Right Angle Interlock, three piston rings are combined into one.

An extensive advertising campaign in The Saturday Evening Post, Literary Digest, Progressive Farmer, Successful Farming, Country Gentleman and Sunset Magazine, will let 17,579,284 readers know about ZELNICKER *Ever-Tyte* Piston Rings. Such tremendous influence is bound to bring you orders. If you want a supply better stock them now. Be ready when the call comes. Don't miss a single sale.

Satisfied customers and bigger profits for you.
Write for our proposition.

THE EVER TIGHT PISTON RING COMPANY
Saint Louis, Mo.

GUARANTY BOND

We guarantee ZELNICKER *Ever-Tyte* Piston Rings to produce higher compression, develop more power, and use less fuel and lubricating oil, you to be the sole judge.

We will refund the full purchase price to any purchaser upon the return of the rings if they fail to give absolute satisfaction within a period of twelve months from date of installation.

THE EVER TIGHT PISTON RING CO. ST. LOUIS

No. 629,592

M. Zelnicker
PRES.

Read
The Guaranty Bond

project; and how barriers had been battered down and pocketbooks finally opened up by this sincere, quiet young man, whose dream it was to make Sullivan county, Illinois, the home of "America's Greatest Truck."

Mr. Petrie, when introduced was greeted with a salvo of applause, while friendliness shone from smiling faces.

He was no orator, but every ear drank in the story he told about the parts that were being put into the "Mutual" and how the Mutual Truck Company had a right to claim they were building "America's Greatest Truck" by reason of the fact that no other single truck in America contained more than a few of the super-specifications that formed the Mutual.

The editor of the local daily newspaper painted a picture of the advantage of industrializing the county, which aroused marked enthusiasm.

The advertising man from Chicago told of the early struggles of other truck companies that were now employing many thousand workmen, and predicted a similar growth and success for Sullivan's infant industry.

It was evident that the whole crowd considered the thing as their enterprise; and that nothing short of "America's Greatest Truck" would be good enough for Sullivan county.

Industrialization of rural communities is no new thing. Hunger for industries by towns and villages that are reaching out blindly for they know not what has been cruelly exploited times without number by "Rufus Wallingford"; but, when a whole rich county, including its banks and bankers, gets back of an enterprise after two years of testing-out the sincerity and judgment of its promoter and makes the opening of the plant a community holiday, a momentum is generated that should carry such an industry to marked success.

Farmers Show Interest in Plan for National Road System.

Farmers throughout the country are showing a deep interest in the movement to establish a national system of public roads. They are asking their state highway officials and representatives in Congress for definite information concerning the national highway bill now pending in the United States Senate, and with a clear understanding of the national road project they are in general expressing their approval.

An impression is held in some sections that the continuation of federal aid will be affected should the pending measure become a law, since it provides for construction and maintenance under exclusive federal control on such highways as may become state links in the national system. The fear has been expressed that such a step would result in a lessening of federal co-operation on purely state and county roads.

Senator Townsend, of Michigan, author of the bill and chairman of the Senate Committee on Post Offices and Post Roads, is keeping in close touch with highway problems, particularly during this period, when auxiliaries to railways and quicker methods of food product distribution are so urgently needed to check living costs.

Noting this tendency of fear that the national highway project might in some way affect adversely the present system of federal and state co-operation, Senator Townsend has expressed the opinion with emphasis that the federal aid plan will in nowise be weakened.

On the contrary, the senator asserts that federal aid will be strengthened, since roads are what the people need. And a greater mileage of permanent highways will be constructed and put into use in much less time under the proposed national highway plan than is possible even at the rate roads are now being built.

"The object of the bill introduced by me," Senator Townsend states, "is to establish and maintain a national system of highways, according to a national plan, connecting the different states of the Union, and affording an example of proper highway construction which will be beneficial to the states.

"The bill does not in any manner injuriously affect existing law; in fact, it provides that the commission credited under it shall have charge of the federal aid law, and shall make reports annually to the Congress as to what is being accomplished under existing law, and to make such recommendations for the future as the operation of the law and its results indicate to be necessary.

"The two systems of road building are separate and distinct, except that they are under control of the same federal commission. The appropriations, however, cannot be mingled, and the results will be known and properly appraised by the people from time to time.

"If the present federal aid law proves satisfactory, it will as a matter of course be continued, and probably be enlarged. If the proved results are not satisfactory, that law will be discontinued. And what I say of the federal aid law will be true of the bill now pending before the Senate. The commission appointed under the law, it may safely be presumed, will be high-grade men, representing different sections of the country, and their life work will be to serve the people by furnishing the best possible highway transportation facilities."

Motor Trucks as Railroad-line Feeders Used in Italy.

The use of motor vehicles as feeders to the railroads is believed to be more extensive in Italy than in any other country in the world.

The total length of normal track railroad lines is 8,700 miles, while the length of routes on which motor services are run

with a fixed time table is 8,070 miles. There are 400 motor lines over which regular public services are operated.

This is due to the fact that Italy is a very mountainous country in which railroad lines can only be built at considerable cost.

Dealer Starts School to Teach Women About Cars.

A New York City motor car dealer in the line of "service to customers" has opened a "school for drivers" in its sales building.

A department of instruction for women is conducted by an expert who is familiar with women's needs and interests along this line. Unlike many similar courses, the instructor has succeeded in adjusting his lessons to the lay mind, and does not assume mechanical knowledge on the part of his class.

U. S. Motor Truck Convoy Is Led by Band.

(Concluded from page 28.)

avorable mention all along the line on account of its musical attainments. It is made up entirely of employees of the Goodyear Tire and Rubber Company at Akron, most of its members being tire-makers. Holly Rossmeyer is the director, and the members are: R. Stoffer, W. G. Stephenson, F. Gunning, Joe Schivinski, John Schivinski, E. Winkelpleck, Roy Hoskins, P. Peterson, E. K. Long, Roy Stevens, F. C. Nichols, R. Smith, F. Joslyn and S. Burkett.

Many of the communities through which the army train passes get up entertainments for the soldiers and nearly every stop at noon finds some community with a basket lunch all prepared for the tired and dusty soldiers. At these stops the Goodyear band furnishes music, and in many of the places the local committees have arranged for dances, at which times the band gets out its dancing music and the "joy is unconfined."

Holly Rossmeyer, the band leader, is quite a character in his way; as well as being a first-class musician he is a speech-maker of no mean attainments, and he helps in the good roads propaganda that is the one big idea of the trip. The band men have made themselves popular with the soldiers and they are considered a very important part of the outfit.

F. A. Seiberling has been identified with the Lincoln Highway ever since its inception, and is one of its staunchest friends as well as being one of the big American boosters for good roads generally. Not only he, but the entire great big Goodyear organization are working tooth and nail for good roads, and the part that the Goodyear band is playing in this epoch-making trip is only what every member of the Goodyear organization would like to be doing—helping the boss boost for good roads.

PASCO

Riding Comfort

Is far greater in a car equipped with PASCO WIRE WHEELS.

You get the full benefit of the elasticity yielded by each wire spoke.

This "springiness" eases the strain on the car-body. Jars and bumps lose most of their terrors.

Chassis repairs diminish. You obtain much higher mileage on tires and gas.

You enjoy more security, since a PASCO Wheel is at least 5 times stronger than a wood wheel, size for size.

Besides—you have the PASCO ingenious spoke-lacing, safety locking device, indestructible hub-cap, complete curb clearance, and many other PASCO advantages.

Perhaps you begin to see why PASCO WIRE WHEELS are so strongly favored by car-owners and manufacturers who KNOW.

DEALERS: Write for our plan.

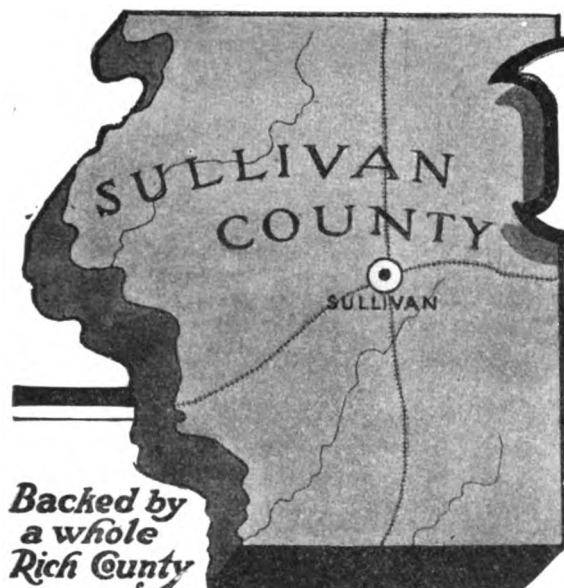
NATIONAL WIRE WHEEL WORKS, Inc.

GENERAL SALES OFFICES, DEPT. G
416-417 Book Bldg., DETROIT, MICH.

FACTORIES AT
Geneva, N. Y.
Hagerstown, Md.

Branches in

| | | |
|--|-------------|---------|
| New York | Chicago | Detroit |
| Minneapolis | Kansas City | |
| San Francisco | Seattle | |
| Dallas | Atlanta | |
| IN CANADA: Northern Electric Co., Ltd., Montreal | | |



*Backed by
a whole
Rich County*

MUTUAL

"America's

An "All Star" Truck

Like an "All-Star" theatrical performance, the MUTUAL TRUCK is an aggregation of units that have won a place and a name for themselves at the very top of the profession.

In making our selection of the units for the MUTUAL we closed our ears to the noise of mere popular advertising; and, by careful comparison, measurement and test, of the rival makes of engines, clutches, transmissions, universals, frames, axles, radiators, steering gears, magnetos, carburetors, wheels and all other parts, chose the ones that the great majority of the best posted authorities on the "inside" agreed with us were the only ones that could be used for a truck that would dare call itself—"America's Greatest Truck."

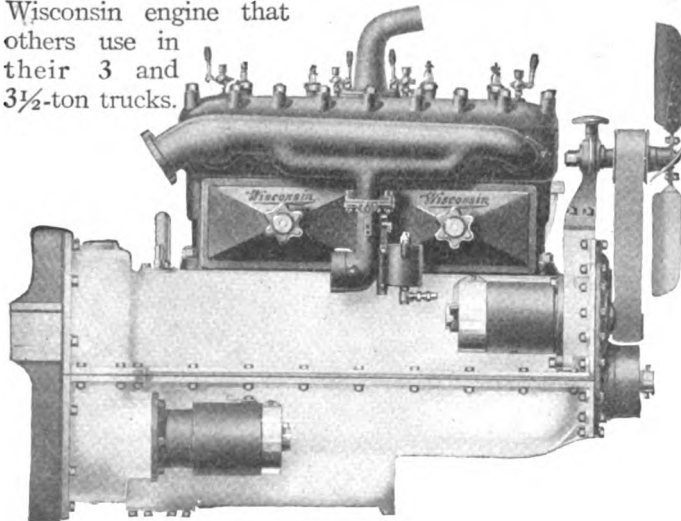
MUTUAL SUPER SPECIFICATIONS (TWO TON)

America's Greatest Truck Engine

From every standpoint—design, material, construction, extreme care in manufacture and inspection, the *Wisconsin Engine* is recognized as indisputably America's Greatest Truck Engine.

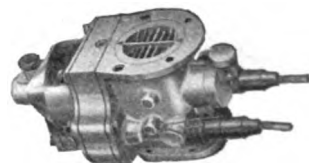
There are several very good "second best" truck engines on the market, any one of which is good enough for an ordinary truck; but there is only one engine that is good enough for "America's Greatest Truck"—and that engine is the "Wisconsin"—first in gas economy, endurance, reliability and all-round engine efficiency.

And we put into our 2-ton MUTUAL the same 4 x 6 Wisconsin engine that others use in their 3 and 3½-ton trucks.



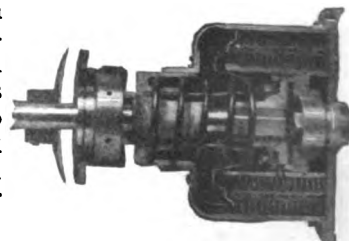
America's Greatest Truck Governor

The Duplex Company's Duplex (not Simplex) is the only one that controls road-speed independent of motor-speed. It makes the driver obey the owner's orders always and everywhere; it is, in fact, an "automatic chauffeur," that adds years of life to the machine by guarding it against abuse. It is vastly more accurate than throttle control; makes a 20% increase in gasoline efficiency by use of a patented "grid" valve instead of the butterfly type. It proportions fuel-feed to suit road conditions, delivers power as needed, and insures a quick get-away. The Duplex delivers more power on hills and bad roads; increases average road speed 20-30% and acts as an automatic safety brake on steep down grades. Incidentally it costs us 2 to 5 times as much as other makes and types.



America's Greatest Truck Clutch

The Hele-Shaw, Universal No. 5, oil-immersed, multiple-disc clutch costs us twice as much as the next best, and from three to four times as much as clutches used on the majority of trucks. It gives a smooth, silent but positive pick-up; a firm final grip; and saves the engine and entire mechanism (including tires) the ruinous "racking" that cheap clutches cause. You will tolerate no other clutch on any truck you own after you use the Hele-Shaw.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

MUTUAL

Greatest Truck

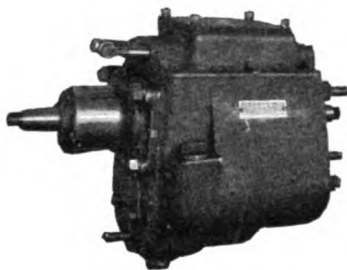
2-3½-5 TON

America's Greatest Truck Universal

Could it be anything but a Spicer? And we use three Spicer joints in the shaft and a fourth in the universal clutch itself. Here, too, we put into our 2-ton Mutual a size used for 3 and 3½-ton trucks by all other makers who use the Spicer.

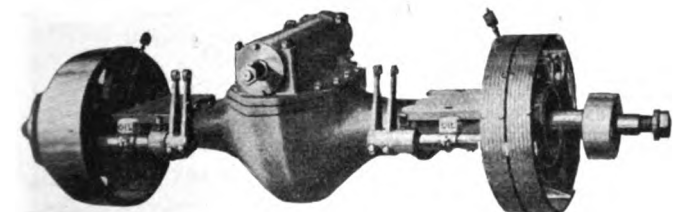
America's Greatest Truck Transmission

"Fuller" of course; and their model "G5" selective; with removable plates, to permit attachment of mechanical hoist and tire pump. Four speeds forward and reverse. A simple sturdy, dependable gear-set used by leading high-priced truck makers on their 3 and 3½-ton models.



America's Greatest Truck Axles (Ball Bearing)

To insure the highest efficiency, we adopted the Sheldon Worm Gear Axle—*first* because both the worm thrust and radial loads are taken by ball bearings, which offer less friction than any other type of bearing. *Second*—because it is of the semi-floating type, which has the advantages of greater simplicity, less weight, greater carrying capacity, greater resistance to side shocks, lower maintenance cost and greater ease of removing wheels for



inspection. The more deeply versed in scientific automotive engineering a man is, the more emphatic will be his declaration that the Sheldon is America's Greatest Truck Axle.

Sheldon Ball bearing steering knuckle type of Front Axle was adopted as a matter of course.

And These, Too, Are Greatest:

Parish and Bingham pressed steel Frame; extra heavy type. Length 224 inches.

Mather Chrome Vanadium Springs.

Smith Metal Wheels for solid tires—regular equipment and not a costly extra.

Dayton Steel Wheels for pneumatic tires.

Goodyear or Firestone Tires; 36 x 4 solid for front wheels and 36 x 8 for rear; or same makes of Pneumatic tires as an option, at an extra cost.

Ross Steering Gear—with 20 inch wheel (not 17-18 inch).

Perfex Radiator, worth a big story in itself.

Bosch Magneto—type ZR4 with impulse-starter. Dust proof and water proof.

Stromberg Carburetor; type M.

Bound Brook Oilless Bushings; throughout.

Weather-tite Cab—fit for a King; regular equipment.

Powell Muffler—12 sections. Remarkably silent.

Electric Steel Castings at vital points, where others use Malleables.

25-Gallon Gasoline Tank

Special 2½-gallon Reserve Lubricating Oil Tank.
Wheel base—150 inch.

Specifications on the Mutual 3½-ton and 5-ton are equally "Great."

Dealer Territory Now Being Assigned

And we shall be as particular in choosing our local sales representatives as we were in selecting the parts that make the MUTUAL—

"America's Greatest Truck"

But, when we *do* find our man, we *back* him to the limit; and help him with a combined local and class journal advertising campaign that has no parallel in truckdom.

MUTUAL TRUCK COMPANY, SULLIVAN, INDIANA, U. S. A.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Readers' Questions and Answers

Laws Regulating Trailers.

Question.—Will you kindly publish in the next issue of the American Garage & Auto Dealer the requirements by law concerning registration fees for trailers, limitation of size, weight and speed?—H. W. B., Valparaiso.

Answer.—It is reported by the Trailer Manufacturers' Association, of New York, that several states have recently enacted new laws increasing registration fees for motor trucks, as well as trailers, and imposing new limitations of size, weight and speed. Also that similar bills are now pending in legislatures of other states.

New laws regarding weight and size limitations were recently passed, as follows:

Pennsylvania, 26,000 pounds gross weight of vehicle and load.

Wisconsin, 24,000 pounds gross, 18,000 pounds on one axle, and 800 pounds per inch width of tire.

Indiana, 10 tons gross.

Illinois, 16,000 pounds on one axle, and 800 pounds per inch width of tire.

North Carolina, 5½ tons load capacity.

Iowa, 14 tons gross, 4 tons on any wheel and 800 pounds per inch width of tire.

Dimensions of trucks, which includes trucks with semi-trailers, and length of trailer trains are fixed as follows:

Pennsylvania, length of a single vehicle 28 feet, width 90 inches.

Wisconsin, length of vehicle 30 feet, width 96 inches, length of trailer train 100 feet between 8 P. M. and 5 A. M.

Illinois, length of train 65 feet.

A very wide variation in registration fees for trucks and trailers is indicated by recent laws, ranging as follows:

Pennsylvania, \$15 for a truck of two tons capacity to \$150 for a seven-ton truck, and \$2 for a trailer weighing 500 pounds to \$15 for one weighing more than 2,000 pounds. Those weighing less than 500 pounds are exempt.

Indiana, \$6 for trucks of one-fourth ton capacity to \$50 for 7½ tons or more; trailer fees one-half of truck fees.

Illinois, \$15 for truck or trailer weighing 7,000 pounds with load to \$60 for more than 15,000 pounds gross weight.

North Carolina, \$12 for truck of one-ton capacity or less to \$100 for 5½ tons capacity trailers \$10 for first ton and \$20 for each additional ton.

Iowa, \$15 for trucks of one-ton capacity or less to \$175 for solid-tired trucks of 6 tons capacity; trailers \$10 for one-ton capacity to \$70 for solid-tired six-ton trailer. Rubber-tired trailers under 1,000 pounds capacity used with passenger automobiles for personal baggage or effects are exempt.

Conducted by E. C. Pohlmann

Get into the habit of asking questions! The more you ask about your business the more you will know, and the more you know the more money you can make. Do not hesitate to send in your questions, whether you are a dealer, a salesman, a mechanic, a service man, or a stockkeeper, they will be gladly answered.

Perhaps there is something you want to know about a certain car or truck or the specifications of some particular tractor or how to store repair parts, or increase the efficiency of your repair shop. We welcome queries about anything and everything connected with the automotive industry. When a quick answer is desired we will send a reply by mail, otherwise the answer will be printed in this department.

It is maintained by trailer manufacturers that as trailers are designed to track with the rear wheels of the towing vehicles, they do not interfere with or endanger other traffic on the open country roads and the number of trailers that may be hauled by a truck or tractor should not be limited to one or two. If cities are authorized to limit the number in congested streets and districts during the day time, the safety and convenience of general traffic will be sufficiently guarded and development of economy in hauling in remote mining, lumbering and agricultural sections will not be prevented.

* * *

Ford Easily Overheats.

Question.—I have a 1916 Ford, which all at once started to overheat. It runs very smoothly, in fact perfectly, but will boil in less than two miles. I have put in a new set of valves and springs and ground the valves to a perfect seat. I noticed the clearance between push-rod and stem, put in a new cylinder head gasket, took the rear radiator wall off and ran a wire through each tube. I also put in a new magneto coil, commutator and brush, fan and oil tube. The motor cranks easily, the spark advances and retards just right. After the motor begins to boil the exhaust is very heavy. This Ford belongs to me and is the first one that I couldn't remedy. Please advise me.—C. W. B., James, Ala.

Answer.—The first thing to get after is the cooling-water system. In a gravity method of circulation the motive force which keeps the water in motion is very slight, hence the flow is easily stopped by any foreign matter which may become lodged in the passages.

The settlement of scale due to the use of cooling water which contains much matter either in solution or suspension may be partially restricting the free circulation of water. Rust or pieces of deteriorated hose may also be restricting the flow of the water. Examine the cooling system thoroughly and if the trouble is not found, ex-

amine the clearance between the valve stem and the push rod when the motor is hot.

The heavy exhaust when the motor becomes hot shows indications of a sticky exhaust valve or insufficient clearance between valve stem and push rod. If there is clearance and you are sure that none of the valves stick when the motor becomes warmed up, check up the timing again. A motor will run very smoothly with a retarded spark, even under light loads, but heats up very rapidly.

The trouble may also be due to a poor carburetor adjustment, leaky piston rings, or a clogged muffler.

Examine the fan belt for tension, and notice whether the fan is turning at proper speeds corresponding to engine speeds. Finally examine all moving parts, and make sure that there is no binding or harsh action which is absorbing power.

* * *

Wobbling of Front Wheels.

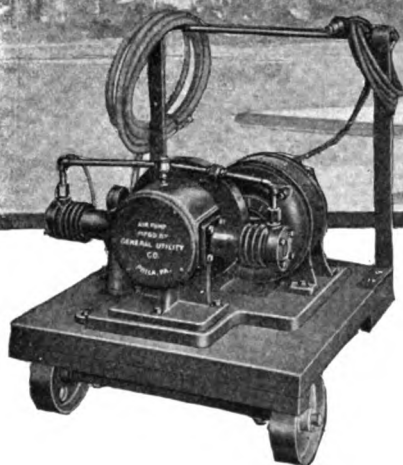
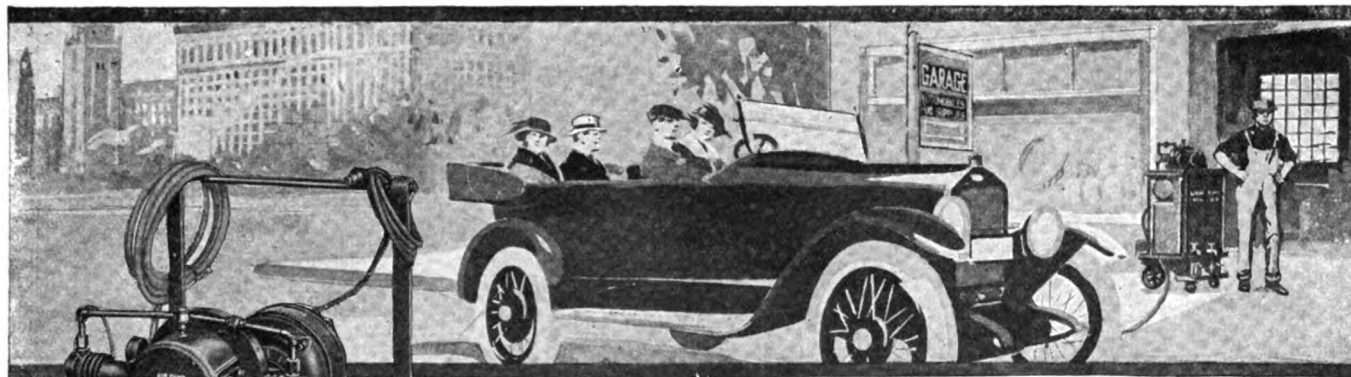
Questions—1. Many of my customers come in and tell me that the front wheels on their cars wobble when riding on a smooth road and shake terribly when the road is rough. In each case I have repaired whatever I thought was causing the trouble and apparently fixed it, only to have them come back in a week or more and complain of the same trouble. Will you tell me how I can remedy this trouble?

2. How is the adjustment for back lash made in the steering mechanism of a 1917 Cole-8?—K. G., Illinois.

Answers.—1. When writing your troubles always state what you did to remedy them, this gives us something to work on and enables us to give specific answers.

Wobbling of the steering wheels is usually caused by back lash in the reduction gears or wear or poor adjustment of the various rod ends in the steering linkage. It is best to examine the whole steering gear mechanism. Start by testing the wheels for alignment, examine the rods and front axle and make sure that neither of them are bent, then jack up the front wheels and see if there is any play in the wheel bearings.

Examine the bushings on the steering knuckles and the rod ends of the steering linkage for play. If the steering linkage is of the ball and socket type, take apart, clean and examine the coil springs; you will probably find these broken. If the reduction gears have considerable back lash, which is due to wear, remove the steering arm and turn the steering shaft one-fourth way around. This will bring new parts of the worm or gear into use. On some of the cars the back lash, when due to poor



**Eight Years of Successful Service
Has Won Them an Enviably Reputation
For Economy and Efficiency**

THE use of a Two-Cylinder General Air Compressor in your garage or service station gives you the best assurance obtainable of a reliable supply of cool, clean air—seven days a week—at rock bottom cost.

Your savings on account of its low operating expense and light upkeep and repair cost will more than repay you your original outlay. From no other compressor can you get the economical, trouble proof, highly efficient service these wonderful little outfits will give you.

Two Cylinder **GENERAL** **AIR COMPRESSORS**

Their capacity is 5000 cubic inches per minute. They inflate an average sized tire in 2 minutes at the lowest possible cost.

Jobbers in territory in which we are not represented will find it to their interest to write for our distributor proposition.

Dealers, write for the name of our exclusive distributor in your territory. He can make immediate delivery.

Our booklet—"The Low Cost of Cool Air"—tells you all about our line



Our Utility Model combines an air compressor, air tank and oil service.

The presence of the oil service—without a word from you—automatically sells the motorist oil.

UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

Factory 1324 Ogden St. Philadelphia - Office 809 New Stock Exchange Bldg., Philadelphia

Utilities that Sell Because They Serve

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

adjustment, can be taken out by bringing the worm gear into closer mesh with the worm by means of an eccentric bushing. If the wear of the reduction gears is considerable, they may have to be replaced in

Motor—Twin cylinder horizontal, four-cycle overhead valves, bore 6-inch, stroke 7-inch.

Ignition—Atwater-Kent.

The Air Cleaner used is the Bennett.

gasolene, also wash the two discs. Occasionally apply a little thresher hard oil to the fibre, see illustration. This will prolong its life wonderfully.

It is best to apply this just before shutting down the motor after a half day's work with a piece of waste by holding it on the fibre while it is rotating so as to distribute it uniformly.

After the motor stands idle for an hour, this grease will all disappear, penetrating the fibre. If it does not disappear, discontinue the practice of putting on grease until such time as the fibre is dry enough to take some more.

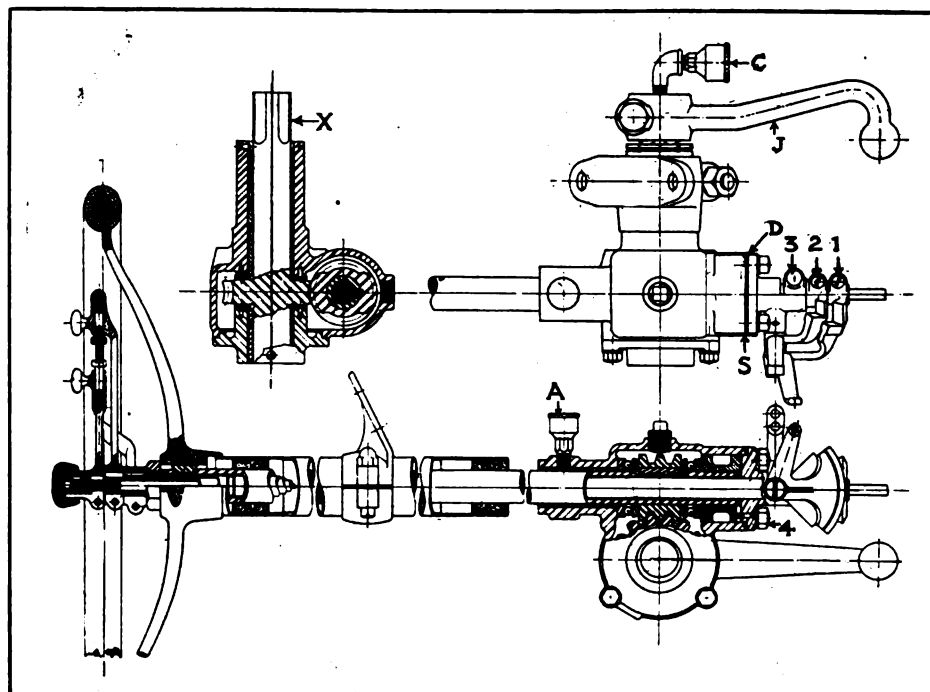
In case you get a surplus of grease on the fibre and cannot start the load, just hold the contact lever tight enough so that the motor keeps on turning, but not the discs. This friction will produce enough heat to burn the surplus grease off, true up the fibre, and make it hold better.

* * *

First Automobile Race.

Question.—Will you kindly publish in the question and answer column of the American Garage and Auto Dealer where and when was the first automobile race ever held in America, and how many cars started?—E. C., Media, Pa.

Answer.—The first automobile race in America was held in Chicago, November 25, 1895, over a course of 54 miles, from Jackson Park to Evanston and back again. A prize of \$500 was offered by the Chicago Times-Herald. Six cars started, four of which were gasoline and two electric. Two of these cars finished. The winner



Steering Mechanism of 1917 Cole 8.

order to entirely take out the back lash.

The lost motion in a bevel gear and sector may be compensated for by screwing in on an adjustment screw which bears against the back of the bevel gear sector. This tends to keep the pinion and sector teeth in contact and eliminates lost motion between them.

2. Referring to the illustration of a Cole steering column, the up and down play in the worm is adjusted by removing the screws 1-2-3-4 and the necessary amount of shims S. Care should be taken not to remove too many shims and thereby bind the worm.

Should the teeth of the worm wheel wear after long service, the ball arm T may be removed and the steering wheel turned until the worm wheel shaft has revolved through a quarter circle. This brings new teeth into contact and the ball and arm may be put on in the new position.

* * *

Specifications of La Crosse Tractor.

Questions.—1. Give me brief specifications of the La Crosse tractor Model "G."

2. How much does the La Crosse "Everyman's Tractor" weigh?

3. What attention should the fibre wheel on the Heider tractor receive?—B. C., Kouts, Ind.

Answers.—1. Brief specifications of the La Crosse tractor model "G" are as follows:

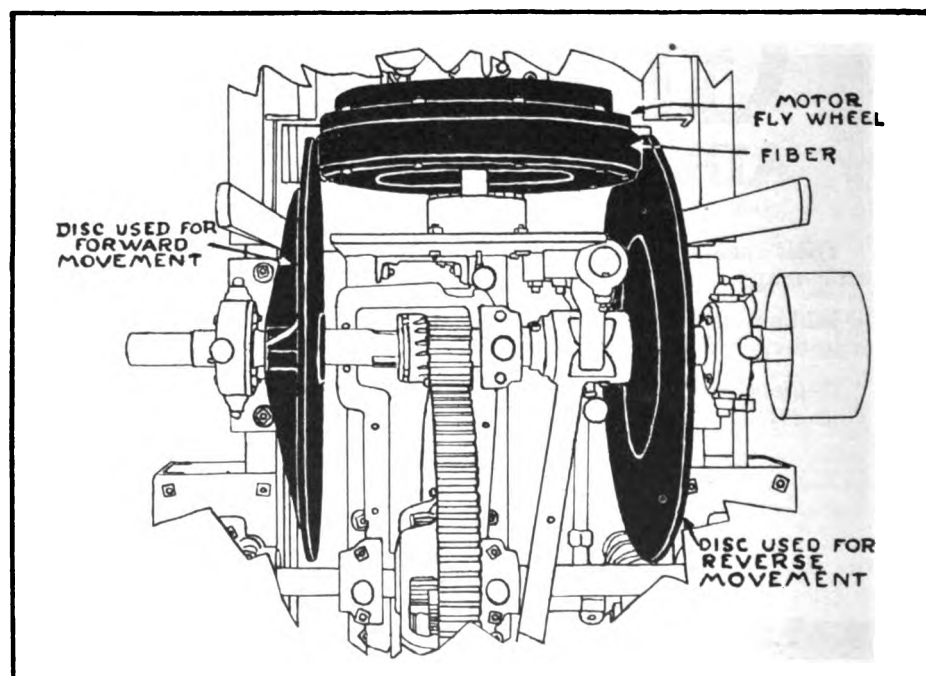
Belt H. P.—24 at 750 r.p.m.

Draw bar H.P.—12 at 2½ m.p.h.

Fuel—Gasoline is used for starting and kerosene for running.

Fuel Capacity—13 gallons.

Speed—2½ m.p.h., one forward and one reverse. Plowing speed same as road speed.



Friction Drive on Heider Tractor, Showing Fiber Disc Used for Transmitting Power.

Type of Tractor—Two drive wheels.

Weight—3,800 pounds.

2. 2,350 pounds.

3. Do not allow any grease to collect on the fibre; if any gets on wash it off with

of the prize was Charles E. Duryea, who won in a period of ten hours and twenty-three minutes. Mr. Duryea covered the course under unfavorable conditions, as the roads were heavy with snow and slush.

**Now
Ready!
Get Your
Copy**

THE new Harvey Spring Book is even more complete than any of its predecessors. Lists over a thousand different springs with specifications and prices. Every Harvey Spring is specially designed for the particular car on which it is to be used. And every Harvey Spring is built so carefully and put through such rigid tests that we are absolutely safe in guaranteeing it against breakage or sagging.

Write to your jobber or to us for
copy of the new Harvey Book

Harvey Spring & Forging Co.
1049 17th Street. Racine, Wisconsin



Harvey Dealers are well supplied with general sales helps—striking window decalcomanias, moving pictures, slides and inside wall posters as well as the Harvey Spring Book. There's a Harvey Jobber near you ready to make immediate delivery on any Harvey Spring you want.

Facts and Ideas for the Tire Dealer

Big Truck Firm Advocates Pneumatic Tire Equipment.

In a letter to its sales force, the Packard Motor Car Co. gives reasons for its belief that pneumatic tire equipment gives better truck service.

"When you are selling Packards, are you bringing out the advantages of pneumatic tires over solid tires? Do you realize what pneumatic equipment means to the purchaser and to you?

"Let us analyze the situation right now.

"Pneumatic tires for trucks are here to stay. That they cost more than solid tires has been the great obstacle in their complete adoption. But, we now have facts to show that in the long run they are cheaper and more satisfactory than solid tires.

"In the first place, users have found that pneumatic tires provide a better cushion than solid tires do. This cushioning quality tends to protect the truck from vibration and consequently cuts down repair and upkeep cost. Also, this same cushioning quality protects the load and saves breakage where fragile materials are being carried.

"In the second place, pneumatic truck tires provide better traction for the truck than solid tires. This improved traction enables the truck to operate more continuously.

"Thirdly, it has been discovered that pneumatic equipment enables the truck to run more miles and consequently haul more goods in the course of a day's time. This is largely because the minimum speed of the truck is increased. Many people have the erroneous idea that the only advantage in pneumatic tires is to increase the maximum speed of the truck. Experience has proved that this is not true.

"The fact is that one of the principal reasons why a pneumatic equipped truck can do more work in a day's time is because it does not have to slow down so much over rough-going and consequently is able to pile up more mileage in a day.

"In the fourth place, pneumatic tires effect some savings in fuel and oil consumption. Just what these savings will be on the average no one can tell at this time. The savings will vary under different conditions, but many experiences indicate clearly that there is a tendency for pneumatic tires to save in this direction.

"In the fifth place, it is quite apparent that pneumatic tires save roads. Inasmuch as we expect the public to build, pay for, and maintain the highways over which motor trucks are to run, probably it may not be unwise for us to consider such means as we have at our disposal to minimize the destruction of these roads after they are built. Experience indicates that pneumatic tires offer savings in this direction.

"Perhaps, the question of savings is not so important as we may anticipate. The

big fact, however, is that pneumatic tires on trucks will add to the superiority of their service. In selling this optional equipment you are not only doing the buyer a good turn, but you are building up your own prestige.

"Pneumatics may cost more than solid tires but don't forget that trucks cost more than teams. Just remember the character of the service.

"If you try to sell pneumatics on any one of the above points, you will probably fail. But if you combine the qualities—cushioning effect, added tractive result, increased daily radius of operation, saving in fuel and oil and saving to the roads—you can easily justify the extra initial cost of this equipment.

"Push pneumatics. They will in turn push your business."

Does Not Believe in Definite Mileage Guarantees.

F. C. Millhoff, general sales manager of the Miller Rubber Co., doesn't believe in tire mileage guarantees. He has just authorized the following statement on the subject:

"The guarantee that a tire is built to run a definite number of miles is not only confusing to the consumer, but it is a reflection on the tire itself. No one would guarantee that a pair of rubbers would wear a certain number of miles or that a pencil eraser would last a certain number of erasings; yet the same principle applies in those cases as with tires.

"In the beginning manufacturers, in order to introduce their tires and assure purchases of a certain mileage, established guarantees. Even now new and hitherto unknown concerns that are springing into existence every day use the same tactics, but the vast majority of tire users know that the reputation of the company building the tires is of far more importance than guarantee figures. A company that for years has been known to turn out only high grade products can be depended upon to sustain its reputation at all costs.

"Instead of a definite mileage guarantee figure, it is more logical, from the standpoint of the consumer, to establish a policy of unlimited guarantee. Adjustments could be based strictly on some imperfection in workmanship or construction.

"Definite mileage guarantees too frequently lead to a final difference of opinion between the consumer and the tire manufacturer or dealer, when adjustments are sought. Sometimes these differences are ironed out, but more often the customer thinks he hasn't been treated exactly right. And that is the principal evil of the whole business. Satisfied users are what count.

"In the last analysis the public, when buying tires, simply wants the best quality and tire merit available. The experienced motorist knows that tires should be bought strictly on a cost per mile basis—not on a guarantee that any manufacturer may choose to make. The tire that will give the most miles—the one that is not limited by any guarantee—but delivers the most miles—is the most economical and most satisfactory tire to buy."

Disc Steel Wheels Are to Be Used for Pneumatic Truck Tires.

The great advantage of the pneumatic tire over the solid tire has led the manufacturers of trucks and truck users to adopt the pneumatics in almost every line of business.

The use of pneumatic tires on the larger trucks means considerable inconvenience in making tire changes, because these tires weigh in the neighborhood of 250 pounds each and require a very strong man to lift them.

To overcome this disadvantage the manufacturers of disc wheels and axles for motor trucks in co-operation with the large tire manufacturers have designed a disc wheel having unique advantages.

A slot cut from the edge of the disc wheel to the center of the rim admits the valve stem of the inner tube. The wheel is so designed that two strong web braces come beneath the slot, one on each side, thus reinforcing the rim and making it stronger at the slot opening. This feature makes replacement simply a matter of pushing the tire in place and reduces tire changing to a one-man job.

A Tire Every Two Seconds Manufactured at Akron.

Enough tires are manufactured at Akron in one minute to equip all the cars turned out in Detroit in seven and a half minutes. This is based on the recent reports from Detroit which say that the manufacturers are now back on the old automobile-a-minute stride.

This means that every time the clock ticks off a minute the tire builders at Akron make enough tires to equip seven and a half automobiles.

Expert Says that Heat of Friction Does Not Burst Tires.

An expert connected with one of the largest tire manufacturers claims that it is practically impossible for the heat of fast driving or of hot roads to increase the air pressure in a tire to a degree sufficient to burst it. What actually takes place is the softening of the rubber by the heat, breaking down after a time, which causes the tread to come off, or the layers of the fabric to separate and the tire to burst.

Air Compressor Fittings

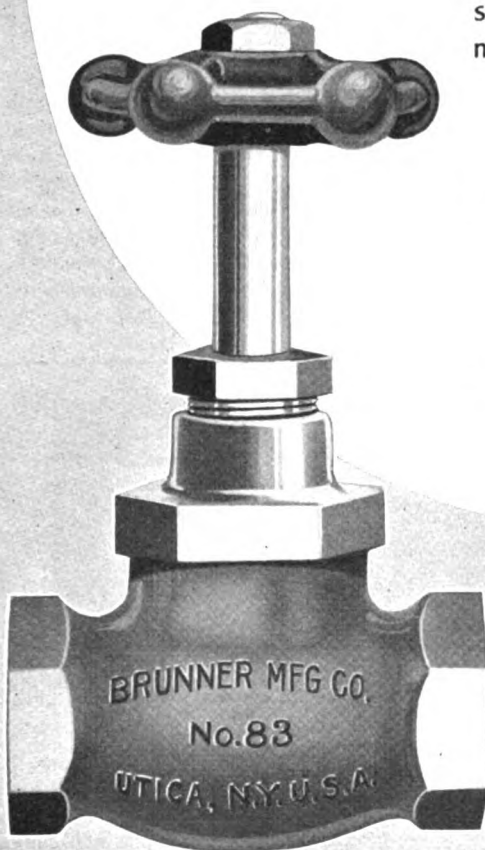
BRUNNER

TAKE VALVES FOR INSTANCE:

Ordinary valves will not hold compressed air. Special design, selected materials and extreme care in perfecting a ground fit are necessary in making a satisfactory air valve. Hand operated or automatic --- each type is an individual engineering problem. Brunner engineers have perfected air valves and other fittings, that Brunner outfits might not at any time give unsatisfactory service because of some apparently unimportant part.

A compressor outfit is no better than its component parts. One poor fitting anywhere in the system will prevent good service. For safety and convenience to yourself and for service to your trade, equip your outfit with Brunner fittings.

Regardless of what compressor you are using, you should use Brunner fittings. Write us for details - name your jobber.



Brunner Manufacturing Co.
Works: Utica, N. Y.

SALES OFFICES:

UTICA, N. Y.

CINCINNATI, OHIO

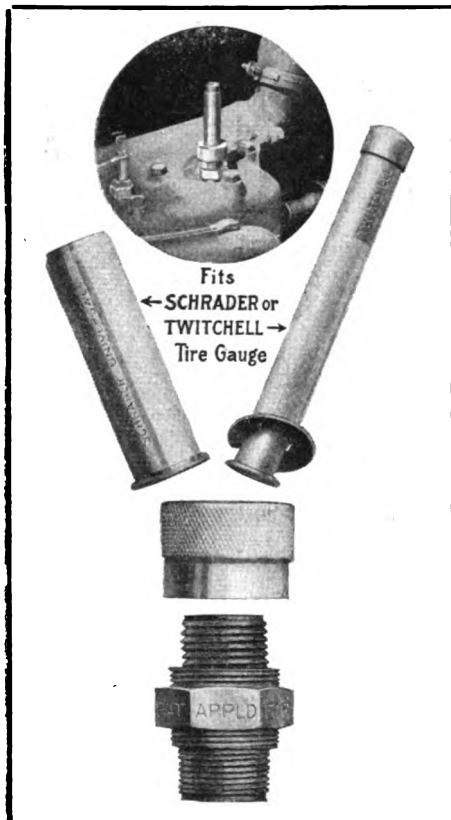
Accessories — They Bring in Money

Here Are Presented Practical Ideas, Suggestions and Merchandising Plans, All Relating to Automotive Equipment Which Energetic Dealers Can Adapt to the Profitable Conduct of the Accessory Branches of Their Business

Compression Tester Tells Which Cylinder Is Weak.

A new device for testing cylinder compression has recently been brought out by the Casey Hudson Co., maker of Liberty sparkplugs.

The Duplex cylinder compression tester, as it is called, is made to fit any cylinder



Device, Which Fits Sparkplug Opening, for Determining Cylinder Compression.

using a half-inch or seven-eighths inch sparkplug. It can be used with a Schrader or Twitchell tire gage. By taking out the sparkplug and inserting the tester the compression is registered when the motor is turned over. This test can be made quickly of all the cylinders, and the weak cylinder, if there is one, instantly detected.

This tester can often find the cause of poor compression that ordinarily would be detected only by tearing down the motor. Information and trade prices can be obtained by writing to Casey Hudson Co., 357-61 E. Ohio street, Chicago, and mentioning American Garage & Auto Dealer.

Ford Crank Case Repair Arm which Fits Without Alterations.

When the original Ford crankcase arm breaks it usually means an expensive repair job and considerable delay.

When this happens the Guaranty repair arm, so the maker says, can be bolted on in a few minutes and is said to give a permanent repair, whether it is put on in the garage or on the road or street. It is made in rights and lefts and fits Ford passenger cars and trucks without alterations. Special prongs, it is claimed, give large bearing surfaces and reinforcement which make the Guaranty arms efficient and durable.

For circulars and special trade price lists write to the Guaranty Motors Co., Cambridge, Mass., mentioning the American Garage & Auto Dealer.

Counter Display Card to Increase Accessory Sales.

A unique counter display stand to help dealers increase their business on Se-Ment-Ol is furnished free of charge to all dealers by the Northwestern Chemical Co.

This display stand clearly tells the purpose of the merchandise it shows. It exhibits the actual reproduction of a leaking radiator holding one can of Se-Ment-Ol



Counter Display Stand for Increasing the Sales of Se-Ment-ol.

powder and one can of Se-Ment-Ol liquid, with the slogan, "Se-Ment-Ol finds the leak and fixes it."

Counter displays are bound to greatly increase the sale of any product, their appeal being wholly in their power of suggestion and impelling action. They induce attention, create a desire and lead to a purchase.

The display stand is made entirely of metal and is said to give greater service and will not soil or become damaged from use or handling like wood or cardboard stands.

Dealers who are interested should write to The Northwestern Chemical Co., Marietta, Ohio, for complete information and

trade prices, mentioning the American Garage & Auto Dealer.

Interesting Catalog of Flexible Metal Hose and Accessories.

An unusually interesting 36-page trade book dealing in detail with the subject of flexible metal hose has just been issued by the Breeze Mfg. Co. The catalog covers metal hose in detail for every type and method of winding; it shows how the flexible hose is applied and why, and what number of trades or industries use it. It is fully illustrated so that the descriptive matter is readily understood.

The manufacturers contend that flexible metal hose in itself is very little understood from the standpoint of application and that there are so many varied characters of winding that the purchaser should be informed as fully as possible before purchasing as to what each type will do.

Dealers and garagemen can obtain a copy of this catalog by writing to The Breeze Mfg. Co., Newark, New Jersey, and mentioning the American Garage & Auto Dealer.

A New Chemical Iron Cement for Repairing Cracks.

A new chemical product, Norwesco iron cement, which will permanently repair cracks, blemishes and sand holes in iron and steel castings, and leaks in radiators, hot and cold water pipes, threaded joints, etc., has been placed on the market by the Northwestern Chemical Co.

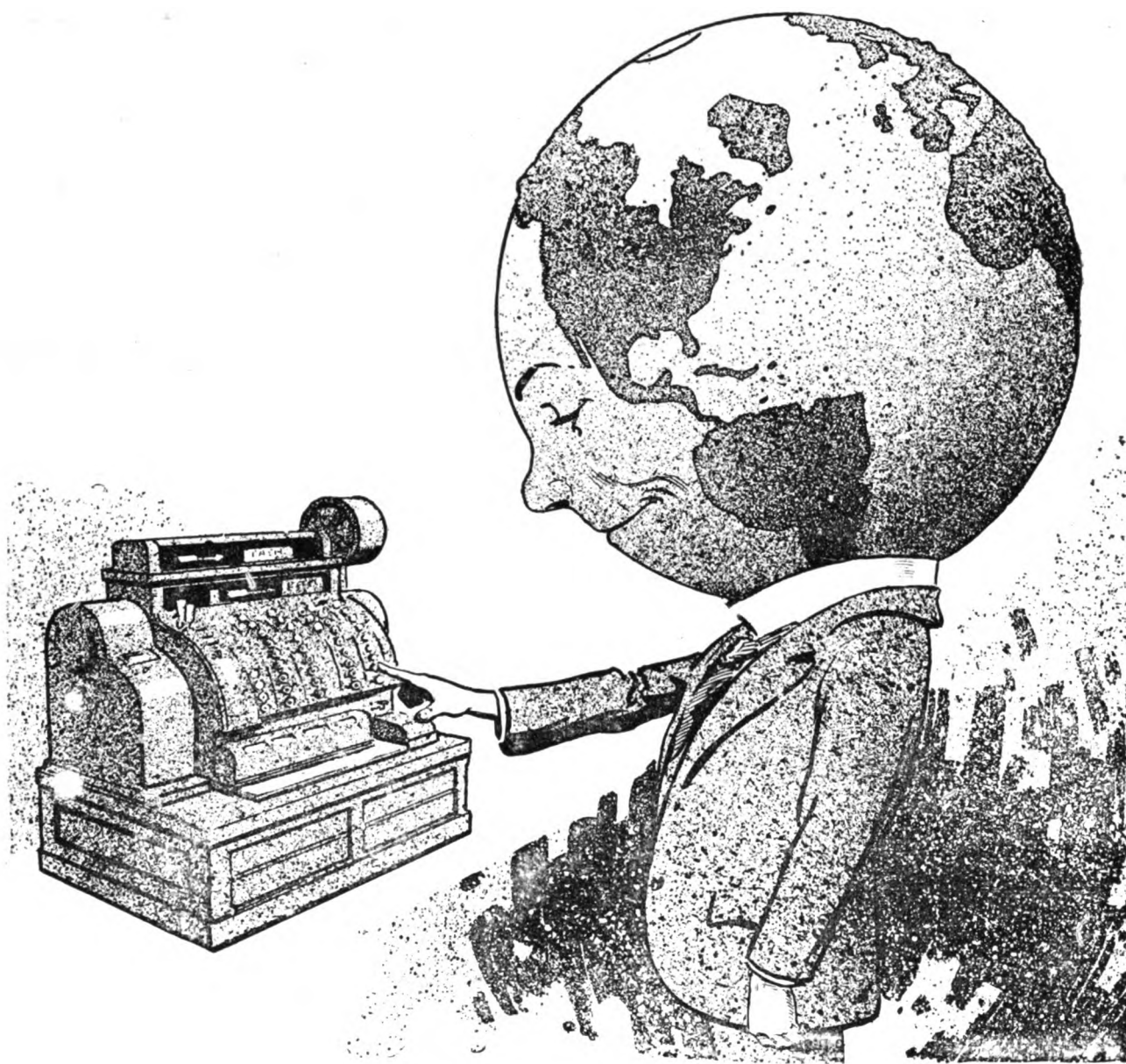
Norwesco iron cement is made in powder form, and the manufacturer says that it is made under strict laboratory supervision



Chemical Iron Cement for Repairing Cracks in Castings and Radiator Leaks.

which insures a standard quality that will give the desired results. It was used extensively by U. S. Government in the war.

For the consumer's convenience Norwesco iron cement is put up in cans of three sizes—six ounces, one pound and 5 pounds. When mixed with water and applied according to directions most remarkable re-



The world's bookkeeper

Modern National Cash Registers are recognized throughout the world as labor-saving machines.

They are used wherever money is handled and accounts kept—in every line of business, in all parts of the world.

National Cash Registers are the result of 35 years of study and invention.

To make them requires 7,100 people, 21 buildings, 40 acres of floor space, and 2,475 patents covering 35,000 claims.

Considering workmanship, materials, and what it does, the National Cash Register is the lowest priced piece of machinery in the world

**The National Cash Register Company
Dayton, Ohio**

Offices in all the principal cities of the world

pairs to iron work can be made at a very small expense.

For information and trade price lists write to the Northwestern Chemical Co., Marietta, Ohio, mentioning the American Garage & Auto Dealer.

Headlight Deflector Which Requires No Alteration of Lamps.

A new headlight deflector which has an adjustable visor for adjusting the rays of light to meet the road 100 to 500 feet distant at a range of one to 42 inches above

the road surface has recently been put on the market by the Howard Headlight Deflector Co.

The Howard headlight deflector snaps over the front of any standard headlight and is held securely in place by three powerful spring-steel clamps. It can be instantly removed and replaced for cleaning the glass and changing light bulbs.

The manufacturers claim that the deflector does not interfere with standard lamps; requires no changes or alterations whatsoever. It is further said that the

ease with which the deflector can be changed from one position to another makes it especially desirable when driving over unfamiliar roads, especially in hills or mountains.

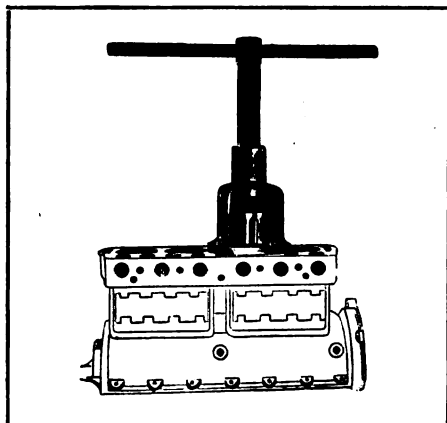
The deflectors come in sizes to fit lamps of all cars and any specials. They are finished in black or white enamel, nickel plated or in special colors. Dealers can obtain trade prices by writing to the Howard Headlight Deflector Co., Detroit, Mich., and mentioning the American Garage & Auto Dealer.

Garage Equipment for Better Efficiency

JIG AND REAMER FOR REBORING FORD CYLINDERS.

The Davis cylinder reborer jig and reamer manufactured by the Hinckley Machine Works, is proving popular with repair men for reboring Ford cylinders.

By the use of this machine, old cylinders



Reborer Machine for Ford Cylinders.

which are thoroughly "seasoned out" are claimed to be made actually superior to new ones.

A properly fitted piston is perhaps the most important repair for an old motor. The Ford company furnishes pistons 1-32nd inch over size, and the Davis outfit rebore cylinders to fit these pistons. In this way, the knock and piston slap due to pistons not properly fitting the boring are eliminated. There is

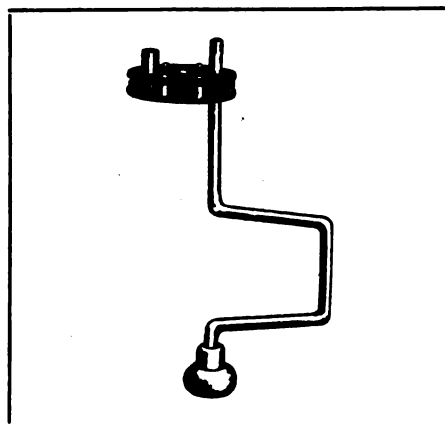
more power for hill climbing and pulling through mud on high, and this means a considerable saving of lubricating oil and gasoline.

Write to the Hinckley Machine Works, Hinckley, Ill., asking for trade price lists, mentioning The American Garage & Auto Dealer.

SPECIAL WRENCH FOR REMOVING FORD CONNECTING ROD NUTS.

A special designed universal offset speed wrench for removing the connecting rod nuts on Ford cars has recently been put on the market by the Sawyer Sales Co.

This wrench is made of steel, having three cut gears, a hardened socket and a heavy brace. The offset is four and three-quarters inches with three inches between the socket and the brace rod. The makers claim that this allows ample distance to place the wrench into the crank case and have the



Special Wrench for Connecting Rod Nuts.

socket fit up directly on the nut of the fourth connecting rod.

The brace is made of one-half-inch steel rod and has a ten-inch swing which gives sufficient leverage to remove the very tight nuts. The wrench is 17 inches over all and weighs four pounds.

For trade price lists and information write to the Sawyer Sales Co., Box No. 50, Lincoln, Nebraska mentioning the American Garage & Auto Dealer.

THE H-B BATTERY CHARGING SERVICE NEEDED IN EVERY GARAGE.

With the enormous increase in automobiles competition among garage men is becoming greater every day. With this increase comes greater demand for battery charging service.

Hobart Bros. manufacture a 500-watt charger which has a special automatic voltage control that enables you to recharge six 6-volt batteries at one time. It is self-starting, uses city power, either alternating or high voltage direct current.

Write to Hobart Bros. Co., Troy, Ohio, for circulars and trade price lists, mentioning the American Garage & Auto Dealer.

A NEW BATTERY TESTER WHICH GIVES CONDITION OF EACH CELL.

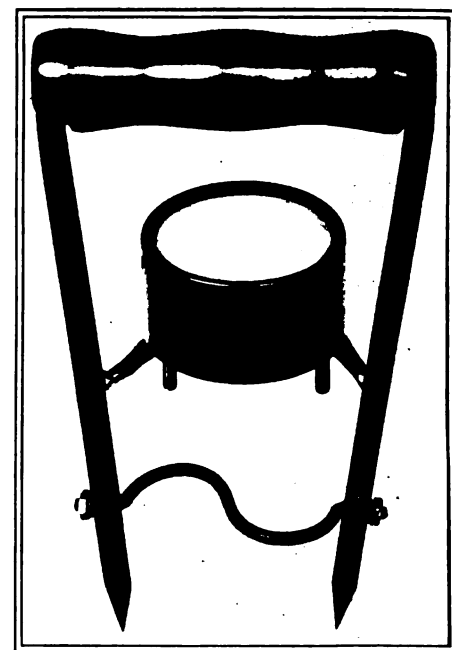
A new battery tester which detects a low cell and tells whether a battery ought to be repaired or not has recently been put on the market by the Service Station Supply Co.

The manufacturers claim that the Hydrate Cell Tester saves the loss of sale of a new battery in many cases because it places the service station in a position to decide promptly whether or not the customer needs a new battery. It eliminates the possibility of giving a rental battery which is better than the one left for recharging and never having it returned.

The use of the Hydrate Cell Tester saves labor and time because it is not necessary to take the battery out of the car, haul it to the shop and make any discharge tests. This can be done with the battery in place on the car.

The makers say that the tester gives a voltage reading under high discharge conditions, which is very important, as any ordinary method of taking a voltage reading on an open circuit tells little or nothing, because a battery that is almost useless will show about the same voltage as a battery which may be in fair condition.

The Hydrate Cell Tester consists of two hex special steel prods three inches apart at the points with upper ends assembled in



Battery Tester for Detecting Low Cell.

handle. A special patented nickel-chromium resistance of .01 ohms connects the prods. Suspended on prods between the prods is located a voltmeter with 2-0-2 volt scale.

Write to the Service Station Supply Co., Detroit, Mich., for complete information and trade price lists, mentioning the American Garage & Auto Dealer.

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

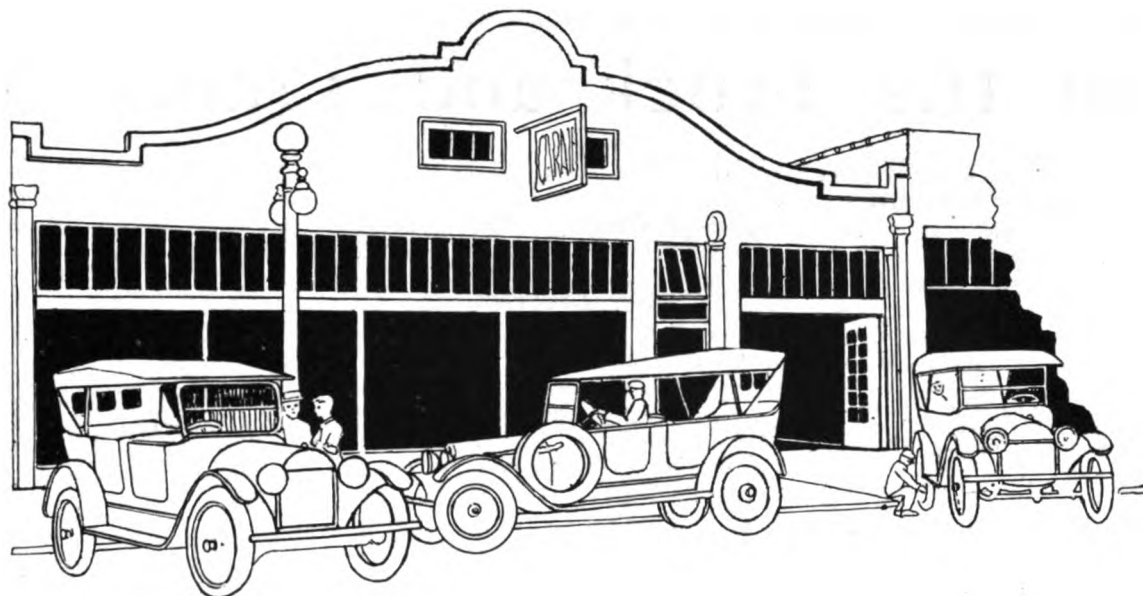
American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....
.....
.....

Name

Address



When business is "rushing"—you will find **GLOBE AIR COMPRESSORS** prove their worth.

The most desirable air equipment is that which requires the least attention once installed. When there are a number of motorists demanding attention, it is very annoying to take time to see "why the free air won't work."

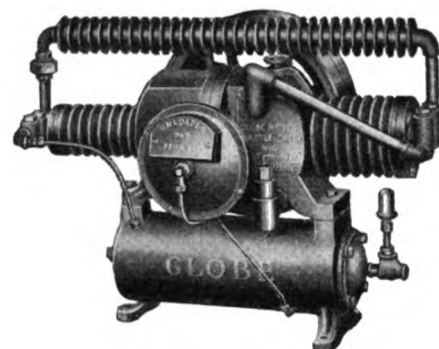
While you are helping some cranky customer to get his tires inflated, you may lose out on a highly profitable repair job.

The best way to eliminate such trying situations is to have an air equipment that will give dependable service under all conditions.

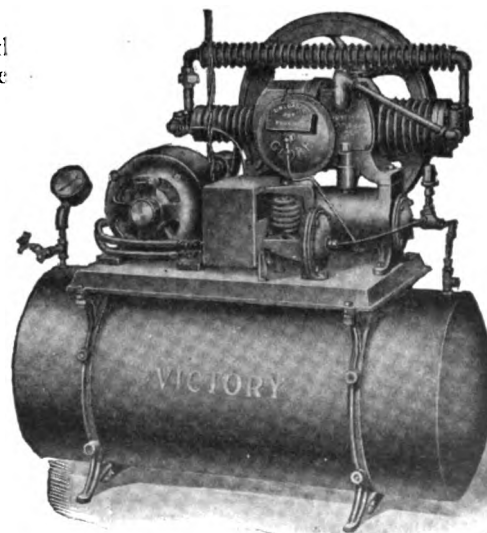
Globe Air Compressors enjoy an enviable reputation, among garagemen everywhere, for the quick, reliable service they render, and the little attention they require. They represent the latest and highest developments in air compressor construction.

They are made on the two-stage principle that has proved most satisfactory for garage purposes, as it produces ample pressure for inflating the heaviest truck tires.

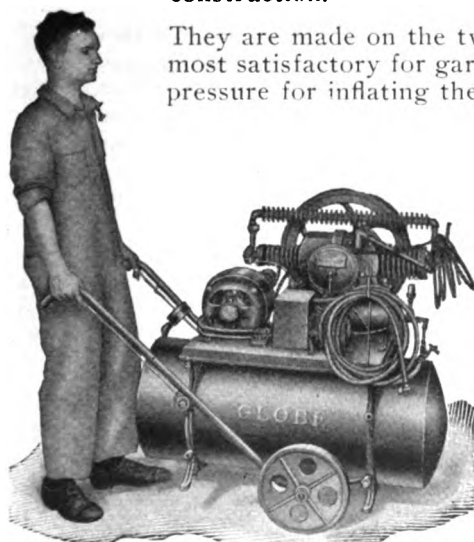
Globe Air Compressors are made in many models—among which is one that will meet your requirements. Before buying your air equipment, you will do well to investigate the GLOBE line. May we send you literature?



GLOBE TYPE B
Two Stage Compressor for
Belt Drive



"VICTORY" Complete Automatic
Motor Drive Unit



"VICTORY-PORTABLE"

**Globe Mfg.
Company**
BATTLE CREEK
MICHIGAN

From the Truck and Trailer Field

Makers to Push Truck Transport for Marketing Farm Produce

The possibilities of improving facilities for marketing farm products, the handling of city to country, and vice versa, transportation problems, are taken into serious consideration by the National Automobile Chamber of Commerce. President Charles Clifton has appointed a strong committee of successful and forceful executives from the motor truck field to be known as the Rural Motor Express Committee.

Coming at a time when the high cost of living is a national issue, which demands close attention and co-operation, the work of this committee is looked upon as being very important. Through it plans can be devised and propaganda started that would make the entire country a network of rural express routes, thereby materially cutting down prices. It would eliminate that much discussed middleman, jobber, and what not and reach the consumer through his local dealer.

The men selected by President Clifton are James L. Geddes, chairman, president of the Kelly Springfield Motor Truck Co.; G. W. Wilcox, director of sales and advertising of The Commerce Motor Car Co.; E. A. Williams, Jr., president and general manager of The Garford Motor Truck Co.; O. H. Browning, truck sales manager, of the International Harvester Corp'n; A. T. Murray, president and general manager of the Bethlehem Motors Corp'n; and F. W. Fenn, secretary, Motor Truck Committee of the N. A. C. C.

The committee will be called together very shortly for a discussion of the problem, and it is possible that they will offer co-operation to the officials at Washington in helping to solve the high cost of living problem, as well as take the matter up with Governor Cox, of Ohio, and Attorney General Alex Grossbeck, of Michigan, in the price reducing campaigns now being waged by those public spirited officials.

The committee has abundant information to prove that the truck in rural express service can be a big factor in reducing prices of food. They can prove that the farmer cannot profitably produce perishable foodstuffs unless he can get them promptly to market. They can prove that these express routes would be keen competition to the alleged combines who now control the food prices of today.

They can prove that the rural express route will allow the farmer to produce more at less expense and give him more time on his farm, as he will not have to spend time taking his produce to market if he does not sell to a combine or one of its subsidiaries. They can prove that rural express routes now in operation are profitable to their owners and a real service to

customers. Rural express routes cut down the number of times an article must be handled from the time it leaves its point of picking until it is delivered to its destination.

G. D. Wilcox, the Detroit member of the committee, who has been notified of his appointment, declares there is much that the committee can and will do, but he declines to give any opinion or definite statement, preferring to let the committee's chairman make public announcements.

Cost of Transportation—Freight Car vs. Motor Trucks.

Now, more than ever, the subject of transporting merchandise by motor trucks is receiving considerable attention and in the light of this fact T. H. Smith, transportation engineer of the Packard Motor Car Co., New York, has analyzed the methods and costs of transporting merchandise by freight car and motor truck.

In analyzing the methods and costs of transportation, Mr. Smith considers the following items:

1. Gross tons freighted.
2. Net tons freighted.
3. Gross miles hauled.
4. Per cent hauled less than 100 miles.
5. Per cent hauled less than 200 miles.
6. Gross tons carload lots.
7. Gross tons less than carload lots.
8. Per cent less carload lots.
9. Freight charges on carload shipment and cost per ton mile.
10. Freight charges on less than carload shipments and cost per ton mile.
11. Cost of packing or crating.
12. Cost of loading and cartage on shippers' end.
13. Unloading and cartage on receiving end.
14. Cost of unpacking.
15. Lost time on account of non-delivery of freight.
16. Tracing department. Payroll and expense account.
17. Switching charges.
18. Demurrage charges.
19. Uncollected damages.

In discussing each of these items he points out that Items 1 and 2 indicate the volume of merchandise moved and the weight of packing materials, says that this packing and crating which is necessary when shipment is made by freight is unnecessary when shipment is made by truck.

Items 3 to 5 indicate what part of the merchandise can best be handled by motor truck. On short freight car hauls the time for handling and switching will often exceed the time in transit.

Items 6 to 8 take into consideration the requirements of packing, handling and other incidental attentions accompanying carload shipments as compared with less than carload shipments, and goes on to say that it is essential that Items 9 to 14 be accurately determined, because many shippers merge such expenses into general overhead accounts, although they are directly chargeable to the movement of

freight. Money actually paid to the railroad companies is sometimes the smaller part of the actual cost. He further states that Item 15 is a very tangible item and must be considered. Items 16 to 19 are self-explanatory.

Mr. Smith then points out the necessities of freight car shipping as follows:

1. Special boxing and crating to prevent loss or damage.
2. Teaming charges to the freight depot.
3. Preparation of bills of lading.
4. Checking of freight bills for classification, weight, rate, payment of freight bills, and entering of damage claims.
5. Tracing department.
6. Unloading and cartage charges from freight station to consignee.
7. Duplication of damaged or lost shipments.

He states that the motor truck has the following advantages in addition to those which are evident from the above data:

1. Freight is delivered promptly and in good order.
2. Quicker delivery means quicker payment.
3. Reduction of investment in lumber and boxing material.
4. Saving of storage space for boxing materials.
5. Saving of freight charges on wet lumber, which is heavier than dry lumber by 10 per cent to 20 per cent.

He gives the following extra charges which a very large manufacturing company in the New York territory calculates incidental to freight shipment:

1. 15 cents per 100 pounds as the average cost for teaming from shipping platform to freight car.
2. 15 cents per 100 pounds for teaming charges from the freight house to the consignee's receiving platform.
3. 24 cents per 100 pounds for boxing and packing.
4. 17 cents per increased freight cost because of weight of boxing and packing materials.

All "Liberty" Trucks Are to Be Returned to America.

It has been rumored in automotive circles that the French people think so highly of the American "Liberty" truck that the French government, at the request of the French motor truck manufacturers, has ruled that none of the "Liberty" trucks are to remain in France but must all be brought back to our shores.

They fear that if these trucks are sold to the French people they will create such a demand that the French motor truck industry will be hampered.

Some Uses of Trailers in Solving the Transportation Problem.

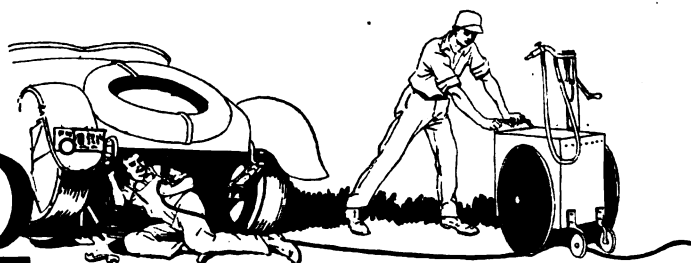
Not very many people are acquainted with the variety of uses to which a trailer can be put to. The following is a list of some of them:

Hauling of merchandise; two and three

**Rough Usage Won't
Hurt the Cord on a**

DURACORD

EXTENSION LAMP



THE cord is Duracord, the same cord that is used on portable tools in shipyards, factories, etc. where the wear is much greater than you would ever give an extension lamp. Its strength is in the covering which is *woven* of heavy cotton yarn (not braided)—no metal to cut through the insulation or scratch polished surfaces as on a steel armored cable.

And you can jerk it around

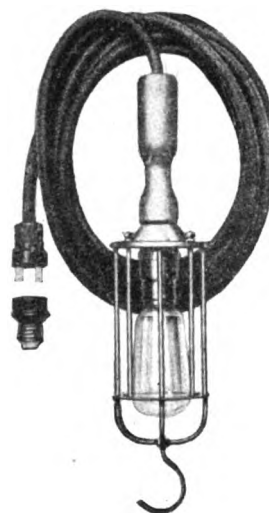
without fear of pulling the cord out of the handle. It's gripped by a patented holdfast fitting that hangs on like a bulldog.

Each lamp complete, all wired up with 20 feet of cord ready for use, packed in an individual box. Prices (excluding bulb)

Light weight \$5

Heavy duty (as illustrated) \$6

Vapor proof \$8



TUBULAR WOVEN FABRIC COMPANY, Pawtucket, Rhode Island

A New *Usaco* Compressor

AIR COMPRESSOR

Two Stage

**LARGER STRONGER
MORE POWERFUL**

Automatic

HERE is a development of the Usaco De Luxe compressor of which thousands have been sold—a machine designed specifically to meet the ever growing demand made by the wide adoption of pneumatic truck tires and still have a surplus of capacity and efficiency. The same essential features responsible for the remarkable success of the De Luxe Compressor, have been retained and new features added. Notable among the improvements are:

The Usaco Air Purifier which acts automatically each time the compressor stops, blowing out oil or moisture that may have accumulated and thus assuring that only pure air will go into the tires.



A High Pressure Tank, double the size of the standard De Luxe, providing capacity for the most severe service ever encountered in inflating Giant Truck Tires. Will be furnished for either 200 or 250 pounds working pressure.

A fan type flywheel which assists greatly in keeping the compressor cool.

One horse power motor, affording double capacity.

These features and several others, as well as the Superior two-stage principle of operation, are described in our circular which will be sent free on request. Everyone interested in tire inflating should have a copy.

**The United States
Air Compressor Co.**

6542 CARNEGIE AVE.
Cleveland, Ohio

By Far the Best by Every Test

trailers in addition to the load on the truck.

Hauling material and tools in the contracting business; permitting deliveries to many places and eliminating the use of several trucks.

Making merchandise deliveries with trailer connected to an automobile.

Hauling farm, dairy and fruit-growers' produce in trailers connected to an automobile.

Carrying mail and parcels on rural routes.

Hauling grain on the farm during threshing time.

Connecting passenger trailer to bus to take care of Sunday and holiday crowds.

Trucks Keep Up with Automobiles on 1,200-Mile Tour.

Each summer members of automobile clubs and road associations hold what is known as the East Michigan Pikes tour, from Detroit to Sault Ste. Marie on the eastern pike and returning through the center of the state, a distance of 1,200 miles of fine scenery consuming nine days.

The outstanding feature of the tour this year was the performance of three Denby trucks which kept up with the automobiles and never missed a control. New two-ton models equipped with Firestone cord tires had no trouble doing 30 miles or better an hour. These trucks carried the big tent, 60 cots for the tourists, all their baggage and a repair outfit, and none of the tired tourists had to wait before their plunge into slumberland.

Narrow tread roads and more sand than is encountered in a trip from New York to San Francisco were negotiated, 200 miles of the trip were over old roads which had been freshly laid with crushed stone and gravel.

This Denby-Firestone performance was a revelation to the farmers, showing what can be done with present roads and what the future holds in store when Michigan's \$50,000,000 good roads program is finished.

The trucks went through the grind in the pine barrens without any repairs, not even a loose bolt, and there was but one puncture from a railroad spike picked up at Sault Ste. Marie. Trucks with power, these have a four-speed transmission, and riding on pneumatics appear to answer the question for the farmers because they not only eliminate damage during shipment but make the most of time.

American Farmers Top the List of Motor Truck Users.

The biggest users of motor trucks in the world are the American farmers. The figures for 1917 show that the farmers had 79,789 motor trucks in operation that year, the manufacturers 75,928 and retailers 74,488. Estimates for 1918 show an increase with the farmers still in the lead.

It is estimated that in 1918, 350,000,000 tons of farm products were hauled to the market in motor trucks by the farmers and gardeners of the United States.

The actual operating figures for the United States show that motor truck transportation is twice as cheap as horse-drawn transportation.

Pliable-drive, Extended Frames, and Power Hoists for Fork Trucks.

To meet the limitations of the Ford worm drive truck the Guaranty Motors Co. has brought out a pliable-drive and extended frame which comes in several serviceable combinations. The manufactur-

steel gears and shafts which fasten to the rear of the Ford transmission. Leading out of this housing is a shaft with a drum on the rear end with cable attached which winds up in connection with an upright steel channel on which are pulleys. A ratchet is operated on the drum to hold the body in a raised position. The operation of the hoist is very simple, throwing the hoist lever forward and pressing down on the low speed pedal raises the load, pressing down the reverse pedal lowers it.

Dealer's exclusive territory is now being assigned, all those interested should write for particulars and discounts to the Guaranty Motors Co., 436-38 Massachusetts avenue, Boston, Mass., mentioning the American Garage & Auto Dealer.

Recently Revised Specifications of Transport Trucks.

Brief revised specifications of the Transport Trucks manufactured by the Transport Truck Co. have recently been announced by officials of the company.

The Model 20, one ton capacity, has a four cylinder, L-head continental motor, 3 $\frac{1}{2}$ x5 inches, 22.5 horse power, equipped with a Stromberg carburetor and Eisemann ignition system. The motor is thermo-syphon cooled through a cellular radiator, and lubricated by the force and splash method.

The Fuller clutch and transmission, Clark internal-gear rear axle, Jacox steering gear, and Simplex governor are standard equipments. The wheel base is 130 inches, front tires 34x-3 $\frac{1}{2}$, rear tires 34x4, weight of chassis 3,070 pounds, and has three speeds forward and one reverse.

The Model 30, one and one-half ton capacity is the same as the Model

20 except that the wheel base is 140 inches long, front tires 36x3 $\frac{1}{2}$, rear tires 36x5, and the chassis weight is 3,450 pounds.

The Model 50, two-ton capacity has a four cylinder, L-head Continental motor, 4 $\frac{1}{2}$ x5 $\frac{1}{2}$ inches, 27.2 horsepower. Everything else is the same as the other two models except that the motor is cooled by pump circulation instead of thermo-syphon, the governor is a Duplex, wheel base is 150 inches, front tires 36x4, rear tires 36x6, the chassis weight is 4,285 pounds, and has four speeds forward and one reverse. This gives an ample and wide power range, necessary with heavy loads over the many varieties of present day roads.

Why I Like My Farm Truck

By Russell Adams, *Farmer*

No matter how bad the flies may be, my truck will not stamp its feet, switch its tail or kick over the tugs.

It will not shy even when it meets a lunatic hurrying to the graveyard astride a motorcycle.

At night I can walk in the barn without fear of being kicked into the next world.

When I need it I know exactly where it is and do not have to look in all the likely, and then the unlikely places in a hundred-acre pasture before I can convince it that breakfast is about to be served.

My truck will not lie down and roll in a cow-lot and then look injured because it has not been carried. It does not blow its nose in my face or use my Sunday shirt in lieu of a handkerchief.

My truck walks twelve miles an hour with a two-ton load and trots eighteen miles an hour when empty.

When I drive on the scales at the stockyards I am not afraid that some sight or noise will cause it to hoist its tail and run away; I climb down and satisfy myself that the weigher is using the scales to weigh my load and not to figure his income tax.

And my truck isn't going to get tangled up in a wire fence the night before I want to start hauling my crop to market.

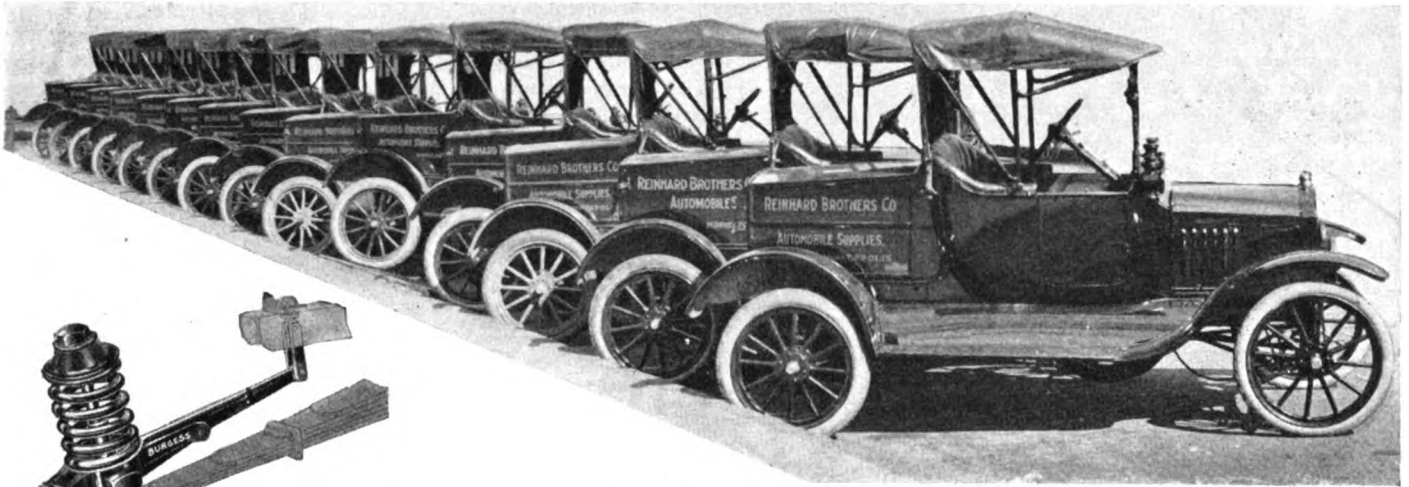
Also, cup grease is cheaper than gall cure, and it takes me farther.

ers say that it makes the Ford worm drive truck sturdy and gives it rugged day-in-and-day-out endurance, at the same time permitting spring capacity up to and including two tons, body capacity up to ten feet back of the driver's seat. It also retains Ford low upkeep. It is said to be simple to attach and prevents the housing from buckling and breaking.

The Guaranty Motors Co. has also brought out a power hoist which can be attached to any truck having a Ford power plant, including the Ford one-ton worm-drive truck.

The hoist consists of a cast steel housing in which are incased the chrome nickel

EVERY ONE OF THESE CARS IS SAVING MONEY ON TIRES, GAS AND REPAIRS



They Are Equipped with Burgess "Triple Duty" Rebound Check and Shock Absorbers

Here is a fleet of salesmen's Ford cars, every one of which is equipped front and rear with Burgess Triple Duty Rebound Check and Shock Absorbers. The owners have learned the comfort and economy of the "Triple Duty."

Make your car ride smoothly over every road. Save money on tires, on gas and on repairs. Install a set on your car, or write us for further particulars. Manufactured by

W. S. BURGESS MFG. CO., St. Joseph, Mich.
Sales Dept., The Zinke Company, Key 1323 Michigan Ave., Chicago, Ill.



Introducing the Latest Idea

ROTARY AIR COMPRESSORS

For All Purposes

ADVANTAGES WORTH CONSIDERING

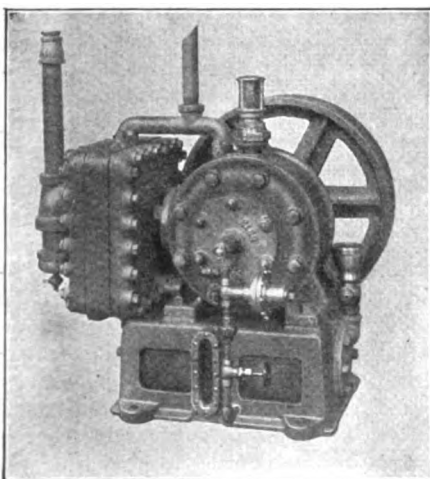
Slow Speed. No Vibration. Positive Displacement.
High Overall Efficiency. Very Low Cost of Upkeep
No Expensive Foundations.
Easy to Install. Perfectly Balanced. Quiet in
Operation.
Check Valves on Discharge. No Valves on Intake.
Simple to Operate.

*Weights Less Than One-Half of Other Types.
All Bearings Hyatt Roller—"High Duty." Only
Five Moving Parts Always Running in Oil.*

Write for Descriptive Matter, Prices and Delivery

JACKSON COMPRESSOR COMPANY

Denver, Colorado, U. S. A.



Rotary Garage Compressors

News of Manufacturers and Jobbers

The New House Organ of Sinclair Refining Company.

A new house organ, "Sinclair Oils," a monthly magazine published by and for the employes of the Sinclair Refining Co., has recently been introduced to its readers.

The magazine is well gotten up and the large editorial staff certainly must assure its readers an abundance of news stories, poetic drippings from the oil vats, and articles disseminating progressive sales and office principles and experiences.

It fulfills a double purpose, first that of being interesting and amusing, and second, that of being instructive. In this respect it attains that ideal of usefulness which similar magazines very seldom do.

New Shafer Bearing Corporation Is Organized.

Chicago is to have an important addition to its manufacturing industries in the new Shafer Bearing Corporation. The charter has just been issued for one million dollars under Illinois laws. Although an outgrowth of the Geo. D. Bailey Co., makers of ball thrust bearings, the new organization will not alter the activities of the Bailey company, which continues as the replacement division of the Shafer corporation and will manufacture ball thrust bearings as well.

The new concern will manufacture a full line of roller bearings for passenger cars, trucks, tractors, etc., upon an en-

sales manager of the Imperial Wheel Co., and more recently vice-president and general manager of the Geo. D. Bailey Co., was elected secretary and treasurer; these officers are to serve for the term of one year. Otto Cullman, president of the Cullman Wheel and Gear Co., of Chicago, was elected chairman of the board of directors, the other members being as follows: Messrs. Julius E. Shafer, George D. Bailey, C. F. Ferguson, as mentioned above; A. A. Worsley, a Chicago attorney, Louis A. Hippach, president and general manager of the Tyler and Hippach Plate Glass Co., Charles F. W. Nichols, president of the Charles F. W. Nichols Company, advertising agents.

The new corporation is really an enlargement of the Geo. D. Bailey Co., and has been organized to take care of the heavily increased business of the older institution. Their main offices will remain in Chicago, and branches are being opened in New York, Minneapolis, Kansas City, and other distributing centers.

Novel Land Submarine Chaser on Western Tour.

Dressed in sailor suits, like regular "gobs," four students of Washington University compose the crew of a boat sent out by the Inland Machine Works, makers of the Inland ring, on a tour through Mis-

Says Increased Production Will Lower Prices.

"The causes that have contributed to the present high level of prices are many and varied, and so are the expedients put forth by individuals and organizations to bring these prices down," declares A. G. Seiberling, vice-president and general manager of the Haynes Automobile Co. "In these times of agitation and industrial unrest, however, it is well to revert to the fundamental truth of economics that prices are governed by the law of supply and demand. And in its final analysis it is the inevitable working of the law of supply and demand that has brought about the present price situation.

"With this basic truth as a hypothesis, the method of remedying the present price condition is a simple one, but, like all simple expedients, extremely effective. It is this: Increase production in all phases of industry to such an extent that there will be more than enough to fill the demand. Let every individual and every corporation shoulder their share of the responsibility and do their full part in speeding up production to place a sufficient supply of commodities on the market to meet the demand. Then and only then will prices drop.

"Federal and state legislation to stop profiteering is a good thing as far as it goes. But legislation cannot change the laws of economics. The upward cycle of prices was originated by a shortage in supply, and the only permanent way to start a downward movement is to remove the shortage."

Safe and Convenient Manifold Heater Put on Market.

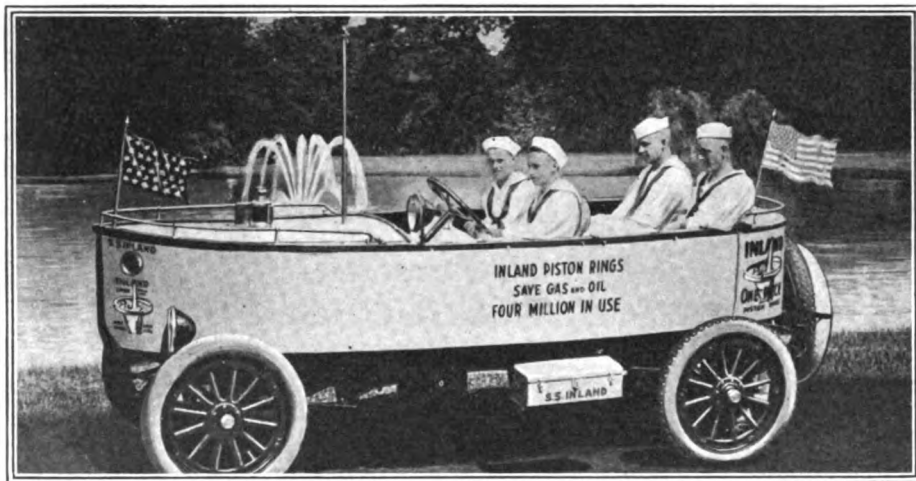
A manifold heater for Ford cars that is said to give continuous service for twelve hours at a minimum expense has recently been put on the market by the Taplex Corp.

The makers claim that it conquers all starting troubles, assures an easy and quick start on the coldest day, and that it can be attached without skilled assistance.

Coe Is Eastern Field Secretary of National Dealers Body.

Charles F. Coe of Boston has been appointed eastern field secretary of the National Automobile Dealers' Association. He is well known to the trade throughout New England and the Northwest, having gained prominence in trade organization work. Mr. Coe was active in all the war "drives" and raised many thousand dollars in the various Liberty Loan campaigns. He was campaign director for the Boston district in the Fourth Loan and it was this loan to which the members of the automotive trade subscribed their record amount.

Mr. Coe was chairman of the New Eng-



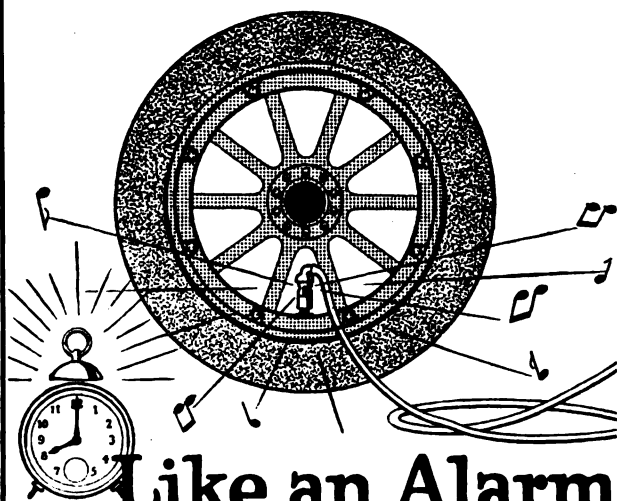
The Four Hardy Members of the Land-Sub Crew on Western Tour.

tirely new principle—a bearing automatically self-aligning and at the same time able to accept a thrust or sideway load equal to the radial or downward load. In other words, a 100 per cent load capacity from any angle.

At the meeting just held Julius E. Shafer, formerly secretary of the Makutchen Bearing Co., was elected president, George D. Bailey, of the Geo. D. Bailey Co., of Chicago, was made vice-president, C. F. Ferguson, at one time

souri, Kansas, Colorado, New Mexico, California and Oregon, and then back home by way of the Yellowstone Park and Denver.

The boat is built on the lines of a fast submarine chaser and mounted on the chassis of a Dodge truck. It has regulation ship lights and all the fittings of such a boat except most of the things of no internal economy. There is no cabin for the brave captain and no "foksul" for the hardy crew, nor is there a cook galley for the concoction of "slum."



Like an Alarm Clock



YOU can pin your faith to the Whistler. With it on your tires, there's never a chance of over-inflating which causes blowouts and give-outs.

Simply set it for the right amount of air. Turn on the supply. After a bit a cheery little whistle announces "enough."

That's saving time for you. And it's sure saving, too. The Whistler lengthens the life of a tire by from 60% to 75% and it saves gasoline, because the tires are evenly inflated.

How does that strike you? It's a proposition that car owners everywhere are getting enthusiastic over. We are creating and forwarding this desire by advertising. We offer you attractive window and counter signs to link up with our campaign and to help get the most of a big business that is certain to come to all of our dealers.

If you have not stocked Whistlers yet, ask your jobber or write us.

The Automatic Safety Tire Valve Corp.
1765 Broadway, New York City

Whistler

TRADE MARK
"IT WHISTLES WHEN IT'S HAD ENOUGH"

Here it is,
Screw it on

Repair Any Auto or Auto Truck

Examine These NEW AUTO BOOKS FREE

Be an expert auto repair man. You can have the skill that makes every complicated trouble as easy to fix as taking out a spark plug. Learn every detail of all makes of cars and trucks. Know exactly how to find what's wrong and how to make all repairs quickly. These great new Auto Books show you how.

Make Money Repairing Autos

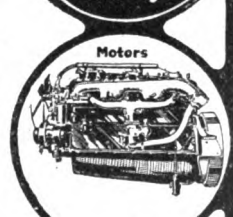
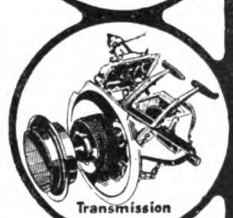
The limited output of new cars in 1918 did not anywhere near meet the demand. Rebuilt cars are selling at a premium. Never before have expert auto repair men been in such great demand and made so much money. Now is your great money-earning opportunity in the auto repair business. Every mechanic, every chauffeur, every car owner needs this great New Library of Automobile Engineering.

50c a Week If You Decide to Buy

Tells About

Explosion Motors, Welding, Motor Construction and Repair, Carburetors and Settings, Valves, Cooling, Lubrication, Flywheels, Clutch, Transmission, Final Drive, Steering, Frames, Tires, Vulcanizing, Ignition, Starting and Lighting Systems, Shop Kinks, Public Garage Design, Equipment and Operation, Electric Storage Batteries, Care and Repair, Steam Cars, Motorcycles, Commercial Trucks, Glossary. More than 100 blueprints of wiring diagrams.

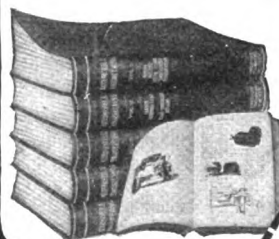
Let us send you the complete six-volume set of Automobile Engineering for one week's examination. Read the simple directions for repairing every automobile trouble. Six thick volumes, 5 1/2 x 8 1/2 inches, flexibly bound in American morocco. 2650 pages, 2100 illustrations, wiring diagrams, etc. Everything in plain, everyday, language, simple to understand. If you decide to keep them, send only \$2 in seven days, and \$2 a month thereafter until the special introductory price of \$19.80 has been paid. The regular price is \$30, so you save \$10.20 by acting at once.



Send No Money

Don't send a penny! Your name and address in the coupon brings the six books to you at once for seven days' trial. With each set we give you absolutely free a \$12 Consulting Membership, entitling you to ask our staff of automobile experts as many questions as you wish, a whole year free. Mail coupon NOW.

American Technical Society
Dept. A-776 Chicago, U. S. A.



AMERICAN TECHNICAL
SOCIETY
Dept. A776, Chicago, U.S.A.

Please send me the six-volume set of Automobile Engineering for seven days' examination, shipping charges collect. If I decide to buy I will send \$2 within seven days and balance at \$2 a month until \$19.80 has been paid. Then you will send me a receipt showing that the set of books and the Consulting Membership are mine and fully paid for. If I think I can get along without the books, I will return them, after seven days, at your expense.

Name.....
Address.....
Reference.....

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

land Automobile Board of Trade which later was merged with the N. A. D. A. He organized and directed its campaign for membership. For some time he was Chevrolet branch manager at Boston, which he resigned to enter war work. He became program director of the U. S. and allied Governments Bureau of Expositions. At Waco, Texas, Mr. Coe arranged an opening celebration for the War Exposition in connection with the Texas Cotton Palace which witnessed the shattering of at least one world's record, as exactly 148 aeroplanes took the air at one time and sustained feature flights over the city for two hours without mishap.

The new field secretary is a gifted speaker and did excellent work all over the Southwest in addressing large audiences on the government war program and expositions. He has also done a great amount of speaking on sales and sales organization, and is considered an expert on advanced selling and publicity methods. Dealers and owners alike have confidence in his judgment and experience. His experience as branch manager and general sales manager for two different companies enables him to see a problem from the point of both dealer and manufacturer.

"I became identified with the N. A. D. A. simply because it represents all that I feel the automobile dealer must have,"

said Mr. Coe regarding his new connection. "Many organizations in a similar position would entirely miss the real value of their existence. The officials of the organization realize that the interests of dealer, manufacturer and owner are identical in the last analysis and for this reason if no other the work of the association will benefit all the classes identified with the industry. A glance at the tremendous good already accomplished is sufficient evidence of the future of the work. A great part of successful selling is successful selection of the thing to be sold. This is a thing I bought myself and will gladly sell to my best friends."

The headquarters of the association for the eastern territory will be at 5 Park Square, Boston.

Mill City Co. Announces Kriesel Multi-Purpose Machine.

A new machine called the Kriesel Multi-Purpose has recently been put on the market by the Mill City Co., of Minneapolis, Minn. This machine is designed for cylinder reboring, gear cutting, drilling, milling and boring.

The machine is especially adaptable to automotive repairing. Complete overhauling of cars, trucks and tractors can be done with this outfit. The makers claim simplicity, compactness and rapidity of operation for the Kriesel machine, and

say it is designed and constructed for extreme strength and simplicity.

User of Bermo Welding Outfit Writes Poem to Its Service.

H. A. King of Athens, Texas, writing to the Bertschy Mfg. Co., Omaha, Neb., makers of the Bermo welding outfit, expresses his complete satisfaction of the machine. He has written this poem praising its service:

The Queen of All

Save the pieces, save the scraps,
Buy a BERMO and learn how
To make the pieces and the scraps
The same as new—and quicker too,
Than waiting a month and a day
For parts that don't fit or stay.
Buy a BERMO and smile and laugh.
No job too hard or too large.
It fits the pocket and the hand.
A Perfect Queen—The BERMO Torch.

WELDING and BRAZING

Our Service to the Trade Is
Unexcelled.

If you are located within 500 miles of Chicago it will pay you to send us the welding, cutting and brazing work that you cannot handle. Our work is guaranteed.

Correspondence from Garagemen Invited

FRANK CHAS. OWENS
19 No. Morgan Street, CHICAGO, ILL.
Phone Monroe 1830.

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

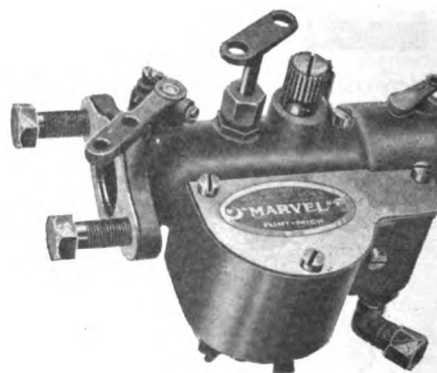
Price F. O. B. Factory \$10.00

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Maxwell, Overland, and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.



Two Old Tires Worth Nothing Made Into One Serviceable Tire by the Ewald Tire Retreader *You Take the Profits!!*

That's the answer—\$20 to \$30 extra profits every day. Just think of this—you staple 10 tires at \$3.00—that's \$30.00—over \$600.00 per month!

Big Free Offer

We will give you absolutely free with each machine an assortment of 1000 Ewald Special Staples—more than enough to staple enough tires to pay for the entire outfit.

Every Day You Delay You Lose Money

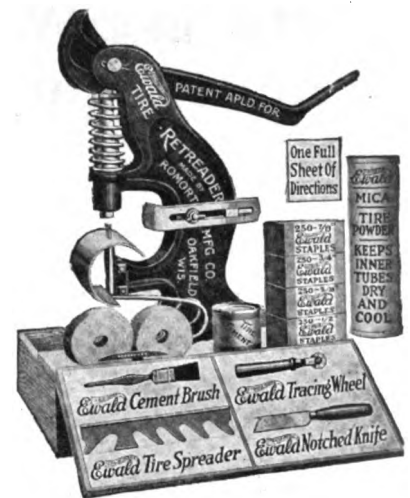
The Ewald pays for itself right away—a few hours' work and the outfit is paid for. Everything after that is **Clear Profit**.

Our extremely low list price of \$20.00 is subject to an attractive trade discount.

Write for all the particulars.

Manufactured by
Romort Mfg. Co.
Oakfield, Wis.

Sales Dept.
The Zinke Co.
1323 Michigan Ave., Chicago, Ill.



Here is more that you get **Absolutely Free**

- 1 Can of Mica Tire Powder
- 1 Tracing Wheel
- 1 Notched Knife
- 1 Tire Spreader
- 1 Cement Brush
- 18 foot Roller Strip
- 1 Can Cement
- 1 Full Sheet of Directions

5,000,000 TIRE PUMPS
Need New Hose Right Now

THE ROSE TIRE PUMP HOSE

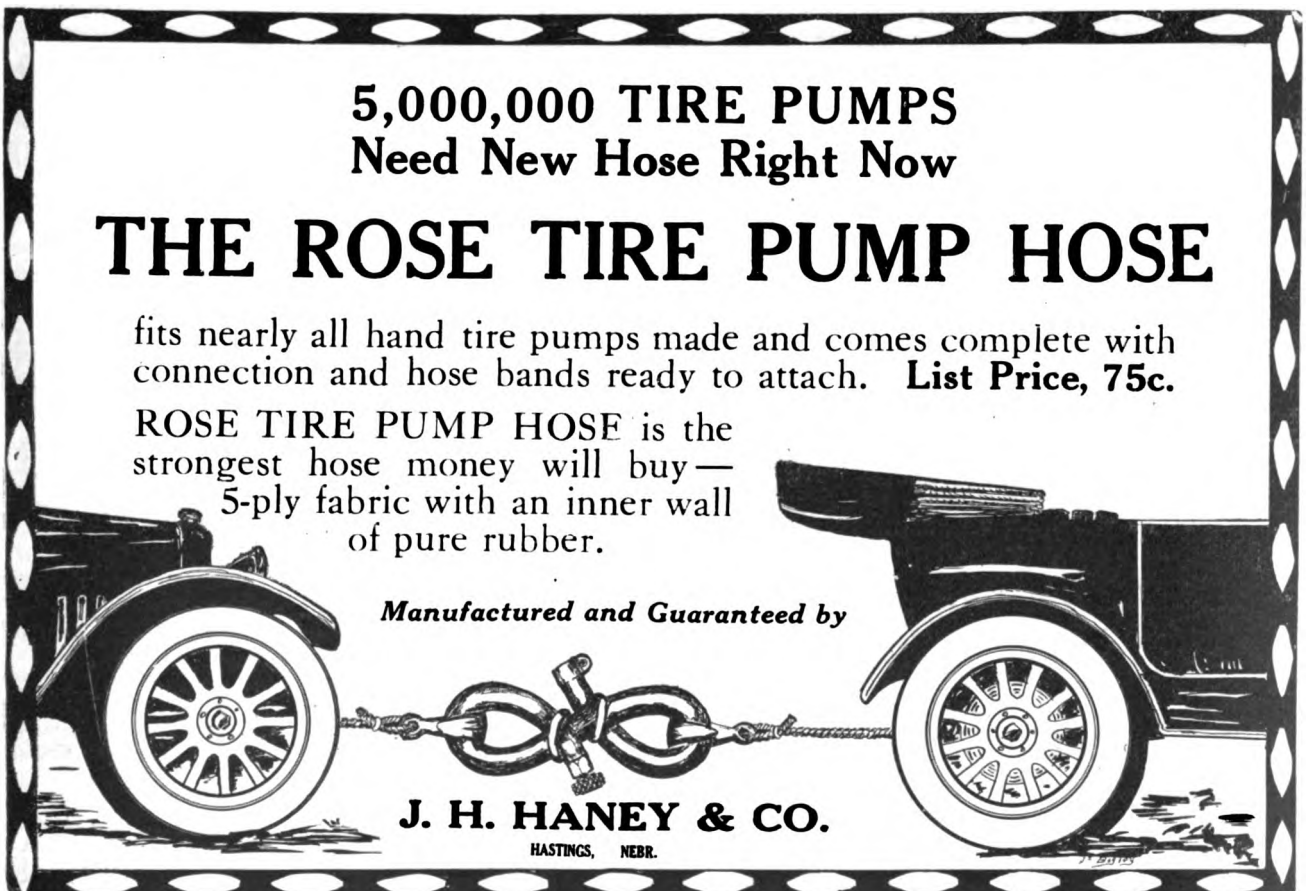
fits nearly all hand tire pumps made and comes complete with connection and hose bands ready to attach. **List Price, 75c.**

ROSE TIRE PUMP HOSE is the strongest hose money will buy—5-ply fabric with an inner wall of pure rubber.

Manufactured and Guaranteed by

J. H. HANEY & CO.

HASTINGS, NEBR.

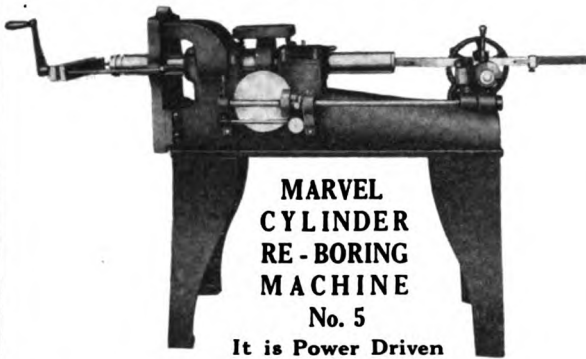


Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

CYLINDER RE-BORING

Means Big Money to the Shop With the Proper Equipment

Of course, you know about the big profits that are being made from cylinder re-boring—you must also realize the necessity of having a first-class machine in order to realize the maximum revenue from this business. The best equipment will prove the most profitable.



**MARVEL
CYLINDER
RE-BORING
MACHINE
No. 5**
It is Power Driven

Embodies every quality that you want in your cylinder Re-boring Equipment

Its accuracy is unexcelled—insuring a good job under every condition.

It is speedy in operation—turns out more work in less time—thus increasing profits.

It is thoroughly reliable—no breakdowns on those busy days.

It is simple in construction—there is nothing to get out of order.

It is power driven—has variable feed speeds and automatic feed release—permitting the operator to attend to other work while re-boring.

It has ample capacity—will handle any job from a motorcycle to a tractor.

The Marvel will soon pay for itself in your shop

Write today for full information on Marvel Cylinder Re-boring Machines and Marco Over Size Pistons

MARVEL MACHINERY COMPANY

30 7 S. Third Street Minneapolis, Minn.

In Writing Please Use Address in Full—It Expedites Delivery

**Always have a spool
of this ever-ready solder
and you are prepared
for any job**

The solder (tin and lead) is a hollow wire filled with a soldering flux in a series of cells or pockets.

KESTER Acid Core Wire Solder

Kester Acid-Core Wire Solder has eliminated half the work (and the hardest half at that) of soldering as the flux and solder are together. Thousands of users have found it a great saver of time, labor, and material.

Sold in 1-lb. coils, in cartons, also on 1-, 5-, and 10-lb. spools.

Order from your jobber or write for a sample.

Chicago Solder Co.
CHICAGO - U.S.A.



“RELCO”

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the “RELCO.”

Approved by the Underwriters' Laboratories, and affords 15% discount on insurance.

DEALERS: You will find a ready market for the “RELCO” Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

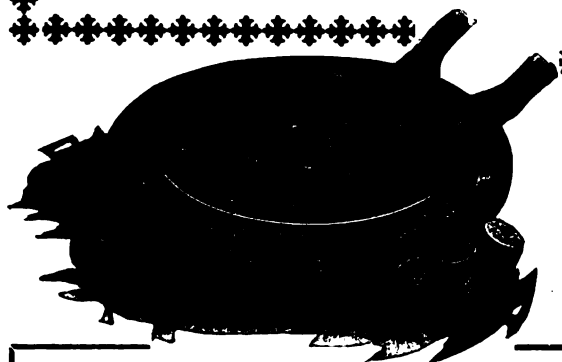
Write today for particulars.

THE RELIANCE COMPANY

411-417 So. Sangamon St., CHICAGO, ILL.

Distributors in every state

End Your Tire Trouble Forever



IT brings new happiness and releases you from the horrors of expected tire trouble, making your car more delightful. Think of the joy of riding along without the eternal fear of a puncture or blow-out. Think of getting 10,000 to 20,000 miles out of every tire—no vulcanizing; no patching; no repairing of any kind, doing away with your inner-tube forever by installing in your tires this wonderful and economical

National Rubber Tirefiller

This marvelous substitute for air is being used by thousands and thousands of satisfied car owners throughout the United States and many foreign countries. We have been manufacturing and selling it for more than seven years; selling last year more than 35,000 sets.

National Rubber Tirefiller is made of the best grade of rubber, cut in small particles, treated, molded and vulcanized by our special steam process, in sizes to fit all standard makes of tires. It is laid in your tires and not melted and poured in. It can be transferred from one tire to another. It will not freeze, melt or harden—fully guaranteed against deterioration in any form, or being affected by atmospheric conditions.

Don't let prejudice stand in your way. Good business judgment demands that you at least make a careful investigation. Let us send you full information, sample and prices.

DEALERS—We have a fine proposition for you.

National Rubber Filler Company

210 College Street

Midlothian, Texas

"Don't Let Business Pass By"



Use a Federal Electric Sign

There are plenty of prospective customers passing within a block or two of your garage every day. Not knowing where to find you, they may turn at the cross street and pass on to your competitor's door.

But a handsome Federal Electric Sign will attract the attention of passers-by for blocks in either direction and from the cross streets as well. It tells them you are ready to give the best of service.

This beautiful porcelain-enameled steel sign cannot rust, decay or fade—an occasional washing keeps it as bright and attractive as new. Costs only a few cents a day for current—no other maintenance expense.

You Have 12 Months To Pay

The first payment brings you the sign. It works day and night for you and always boosts your business. Send today for full information—no obligation.

MAIL THIS COUPON TODAY

Federal Electric Company

Representing

Federal Sign System (Electric)

Lake and Desplaines Sts., Chicago

Please send full information on Enameled Steel Sign for my business and your 12-months-to-pay plan. No obligation.

NAME

ADDRESS

BUSINESS (AG AD-9)

GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

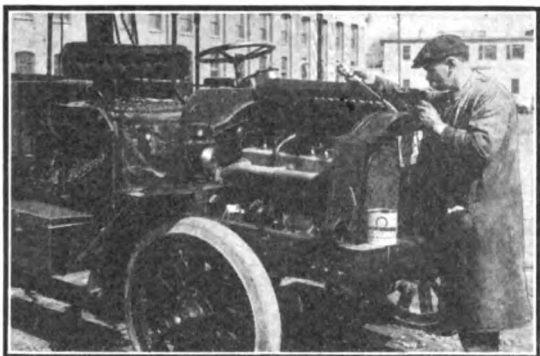
Wm. Ganschow Company
1002 Washington Boulevard
Chicago, Illinois



**Disabled Cars can
be towed in quickly
with it!**



**Robt. Holmes
& Bros.**
DANVILLE-ILLINOIS



**Just a couple of minutes
and the job is well done
—when NOKORODE is used**

Get the habit of using NOKORODE and you will find that when you have repairing to do, that it is the ideal soldering paste. No job has ever proved too complicated for NOKORODE.

Because of its wide range of usefulness, as well as dependability, every garageman should have a supply for every soldering job, regular or emergency.

NOKORODE is a "good habit" to cultivate. Free introductory sample will be sent on request.

The M. W. Dunton Company
Providence, R. I., U. S. A.



Pondelick Brothers

will pay **\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrinding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

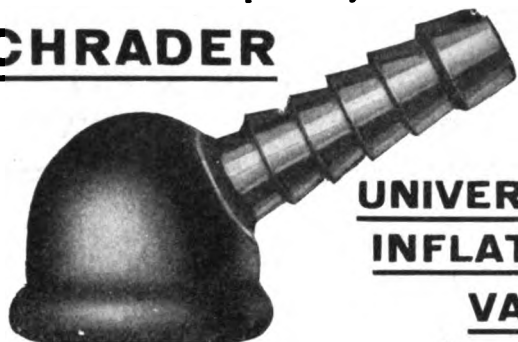
Pondelick Brothers, CHICAGO ILLINOIS

No wasted "Free Air"

SNAP! When the inflating valve is removed the AIR PRESSURE STOPS

All garages and repair shops distributing free air can profitably use the

SCHRADER



**UNIVERSAL
INFLATING
VALVE**

If you have a SCHRADER valve you know that your "bottled air" is safely tucked away the minute it is taken off the tire valve. The air is released by pressing the nozzle of the inflating valve against the tire valve, and stopped by removing the device from the tire valve. Fits any diameter of hose from $\frac{1}{4}$ to $\frac{5}{8}$ inch. Price, \$1.50.

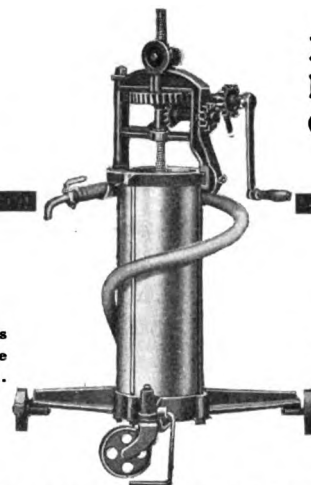
A. SCHRADER'S SON, Inc.
783-793 Atlantic Ave., Brooklyn, N. Y.

**POURS
OUT
STEADY
PROFITS**

**ENTIRELY
HAND
OPERATED**

Model K holds
20 lbs. grease
or 2½ gals. oil.

Model N holds
56 lbs. grease
or 7 gals. oil.



Ekern "Model N" Portable Garage Grease Gun

Undoubtedly there is scarcely any garage equipment which is absolutely indispensable; yet there are a few products which come mighty close to being necessary. Among these, our "MODEL K" and "MODEL N" PORTABLE GARAGE GREASE GUNS are very prominent.

Address us today for full particulars.

H. G. Paro Co.

**1412-14 South Michigan Blvd.
CHICAGO, ILL.**



**All the
"comforts" of home in the
modern train**

America's big railroad men during the past half century have devoted intensive efforts to making travel by rail more comfortable and enjoyable. We have, likewise, studied the problems of imparting comfort and pleasure to riding in a Ford, and as a result of our efforts

**You get that same "comfy" feeling with
W & C SHOCK ABSORBERS**

They help steering, prevent side sway, save tires, and stop the triangular pull that wears out the bearings.

Over 200,000 sets in use.
Write for our trade proposition.

**P. H. WEBBER CO.
Hoopeston, Ill.**



Triangle Tire Patch Brings Repeat Orders



You only have to sell a customer one package of Triangle Tire Patch. The next time he comes in and "hollers" for it.

That makes it a good patch for you to sell. Another reason why you should handle Triangle—there's more money in it. You buy direct from the factory, paying no toll to jobber or salesman.

The Triangle Tire Patch is a guaranteed product. The \$1.00 package fixes 100 punctures and every dealer is authorized to refund the dollar if one patch comes off.

Let us tell you about the margin of profit. Clip and send the coupon now.

TRIANGLE RUBBER CO.
Oklahoma City, Okla.

Clip this coupon for profits

TRIANGLE RUBBER CO., Dept. D.
Oklahoma City, Okla.

Send your direct-to-dealer proposition on Triangle Tire Patch to

.....
.....
.....

"AM-PĒ-CO" PRODUCTS

Sell readily because their superiority
is well known to the Motoring Public

"AM-PĒ-CO" PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. "AM-PĒ-CO" Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes.

We also make the famous "AM-PĒ-CO" WHEEL PULLERS and BRAKE SHOES, both one- and two-piece.

If your jobber does not handle "AM-PĒ-CO" Products, write us direct.

F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

General Selling Agent for

**American
Machine
Products
Co.**

Marshall-
town,
Iowa



GRAHAM SOCKET WRENCHES

Are turned from the best Solid Bar
Steel and are Heat Treated. For

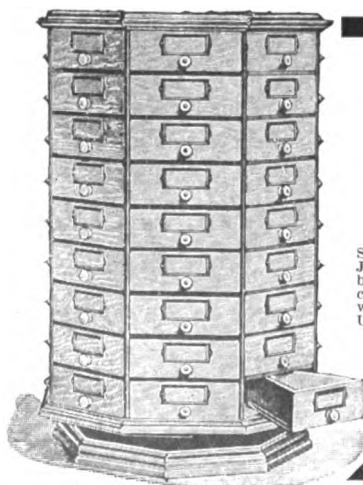
STRENGTH and RELIABILITY

They are unexcelled. Ask for dealer's discount.

Price
\$1.50



Graham Roller Bearing Co., Coudersport, Pa.



**Keep your
supplies in
revolving
cabinets
like these**

Systematic! Conveniently Accessible!
Just like "rolling off a log" to look up
bolts, screws, etc., with this revolving
cabinet. Everything at your finger tips,
with nothing to burden your memory.
Used by leading garages of this country.

Buy today from your jobber.
Catalogue on request.

**American Bolt &
Screw Case Co.**
DAYTON, OHIO

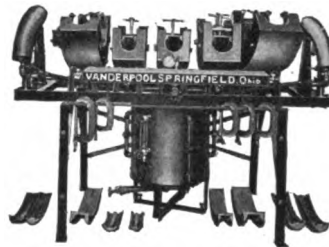
NOTICE

On September first we will move our entire plant from Dayton, Ohio, to Union City, Indiana. We have erected new office and factory buildings there, and will be in a position to meet the demand for our garage testing instruments and publications. Write today for our free illustrated catalogue. Address

H. E. PHILLIPS & CO.
UNION CITY INDIANA

ENORMOUS INCOME FROM INSIGNIFICANT INVESTMENT

Open a Tire Repairing Shop—business pours in. Vanderpool Vulcanizer (5 Cavity Model) has capacity of \$100 worth of work a day. We are the pioneer



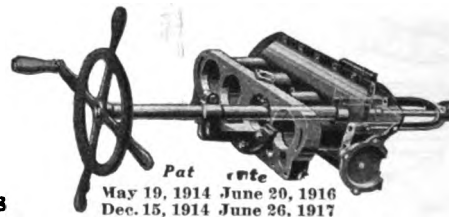
manufacturers of the Dry Cure Vulcanizer—the only vulcanizer that guarantees absolutely PERFECT work. We send you FREE TIRE REPAIRING MANUAL and give you free instruction. Write today for full particulars.

In answering address
Dept. I-15.

Wm. Vanderpool Co., Springfield, Ohio

REPAIRMEN—LISTEN!

The Heiser
Improved
Cylinder
Reboring
Tool for
Ford Motors



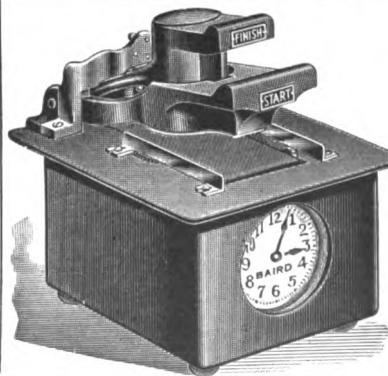
is the only Reboring Tool in the world that is self sharpening. It is the only Tool except expensive grinders that will not leave the finished cylinder slightly tapered toward the bottom. It is the only Tool that rebores between centers—this insures a finished cylinder, square with the crankshaft, round, straight and true. It is adjustable, and the only Tool that will rebores different sizes without losing the adjustment.

The best mechanic in the world can't build reputation without proper TOOLS and EQUIPMENT. The HEISER IMPROVED CYLINDER REBORING TOOL makes good shops out of poor ones and better shops out of good ones.

Write today for full particulars.

Heiser Special Tool Co., 115 Rogers Bldg., Kingston, Mo.

Put your repair charges on a
profitable basis with



**BAIRD
TIMING
DEVICES**

Keep a check on your employees' time and learn exactly what each job costs. Automatic supervision turns losses into profits.

Prices moderate.
Write today for booklet.

Baird Equipment Co.
324 W. Ohio St., Chicago
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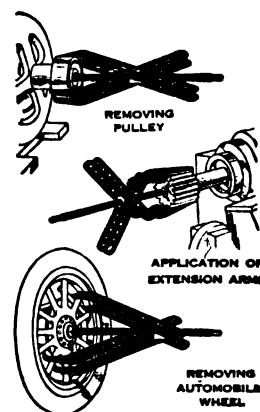
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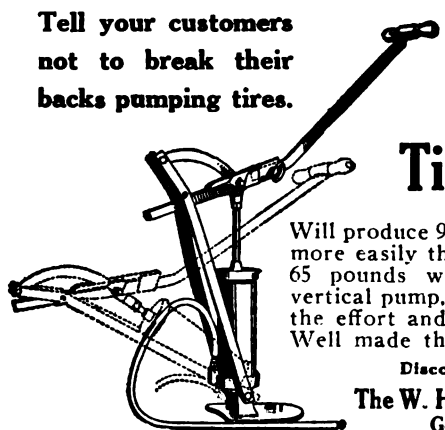
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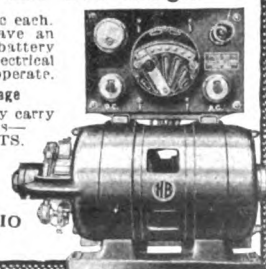
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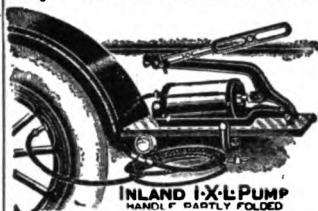
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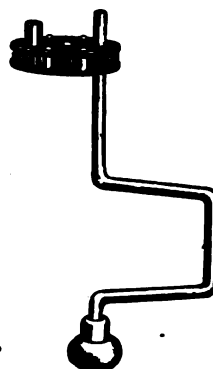


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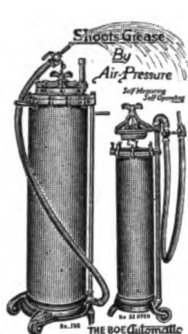


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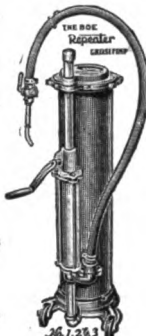
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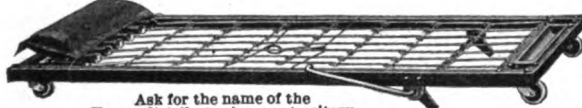
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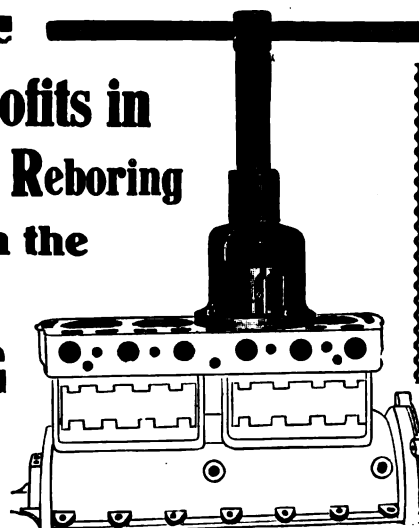
Index to Advertisements

| A | | L | |
|--------------------------------------|----|-------------------------------------|-----------|
| Advance Automobile Accessories Corp. | 5 | Lawrence & Co., L. | 75 |
| American Bolt & Screw Case Co. | 72 | Lourie Mfg. Co. | 75 |
| American Machine Products Co. | 72 | M | |
| American Technical Society | 65 | McDaniel Rubber Co., Leo | — |
| Atlas Auto Supply Co. | 8 | Marvel Carburetor Co. | 66 |
| Auto to Compressor Co. | 39 | Marvel Machinery Co. | 68 |
| Auto Engine Works | 74 | Miller Rubber Co. | 40-41 |
| Auto Wrecking Co. | 74 | Monarch Machine Tool Co. | — |
| Automatic Safety Tire Valve Corp. | 65 | Mutual Truck Co. | 48-49 |
| B | | N | |
| Bailey-Drake Co., Inc. | 35 | National Cash Register Co. | 57 |
| Baird Equipment Co. | 72 | National Rubber Filler Co. | 69 |
| Beck & Corbitt Iron Co. | 75 | National Wire Wheel Works | 47 |
| Bens Big Tire Shop | 73 | New Era Spring and Specialty Co. | 73 |
| Berno Co., A. J. | 74 | New York Coil Co. | — |
| Boe Co., H. M. | 75 | No-Leak-O Piston Ring Co. | 75 |
| Brunner Mfg. Co. | 55 | Norma Company of America, The | 6 |
| Butler Mfg. Co. | 74 | O | |
| Burgess Mfg. Co., W. S. | 63 | Owens, Frank Chas. | 66 |
| C | | P | |
| Calculagraph Co. | 77 | Paro, H. G., Co. | 71 |
| Casey-Hudson Co. | 3 | Phillips, H. E., & Co. | 72 |
| Cassidy Co., Edward A. | — | Pondelick Bros. | 70 |
| Catelain, Andre G. | 74 | Premier Electric Co. | 73 |
| Champion Pneumatic Machinery Co. | — | R | |
| Chicago Solder Co. | 68 | Reliance Co. | 68 |
| Curtis Pneumatic Machinery Co. | 37 | Romort Mfg. Co. | 67 |
| D | | S | |
| Denby Motor Truck Co. | 7 | St. Paul Auto Cylinder Grinding Co. | 75 |
| Dunton Co., The M. W. | 70 | Sawyer Sales Co. | 75 |
| E | | Schrader's Son, Inc., A. | 71 |
| Ever-Tight Piston Ring Co. | 45 | Shaler Co., C. A., Front Cover | — |
| F | | Standard Auto Salvage Co. | 74 |
| Famous Tires Corp. | 74 | States Chemical Co. | — |
| Federal Electric Co. | 69 | Stewart, F. W. | — |
| Flexlume Sign Co., Back Cover | — | Storm Mfg. Co. | 37 |
| Foster Bros. Mfg. Co. | 75 | Sunderland Machinery & Supply Co. | 74 |
| G | | T | |
| Ganschow Co., William | 70 | Thompson Tire & Rubber Co. | 73 |
| Garden City Spring Works | 77 | Times Square Auto Supply Co. | — |
| General Utility Co., 4 and 51 | — | Trexler Co. | — |
| Globe Mfg. Co. | 59 | Triangle Rubber Co. | 71 |
| Graham Roller Bearing Co., The | 72 | Triane Piston Ring Co. | 35 |
| Gray-Heath Co. | — | Tubular Woven Fabric Co. | 61 |
| Greer College of Motoring | 74 | U | |
| H | | Universal Battery Co. | — |
| Halladay Co., L. P. | — | Universal Mfg. & Sales Co. | 75 |
| Haney & Co., J. H. | 67 | U. S. Air Compressor Co. | 61 |
| Harvey Spring & Forging Co. | 53 | Utilities Sales Corp., 4 and 51 | — |
| Haywood Tire & Equipment Co. | 78 | V | |
| Helsar Special Tool Co. | 72 | Vanderpool Vulcanizing Co. | 72 |
| Hinckley Machine Works | 77 | W | |
| Hobart Bros. | 73 | Wagner Specialty Co. | 75 |
| Holmes & Bros., Inc. Robert | 70 | Warshawsky & Co. | 74 |
| Howell Co., The W. H. | 73 | Waxit Mfg. Co. | 71 |
| I | | Webber & Co., F. H. | 71 |
| Inland Machine Works | — | Weston Electrical Instrument Co. | 48 |
|Inside Front Cover | — | Wood & Safford Machine Wks. | — |
| J | | Z | |
| Jackson Compressor Co. | 63 | Zinke Co. | 63 and 67 |
| Jenkins Vulcan Spring Co. | 73 | K | |
| Jewel Electrical Instrument Co. | — | Kennedy Car Liner & Bag Co. | 77 |

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DAVIS REBORING JIG and REAMER



You can rebores old Ford cylinders, and by getting new pistons (1-32 inch oversize) you can make an engine as good as new. This is no exaggeration—old cylinders being thoroughly “seasoned out” are actually superior to new ones.

There is a big demand for this class of work among Ford owners and as soon as you are known to have the equipment, you will get your share.

With a Davis Reboring Jig and Reamer, one man can rebores a set of four cylinders in 60 minutes, and do as good a job as the large shops. And you make a good profit.

We also make a milling attachment for drill press.

Write today for particulars.

HINCKLEY MACHINE WORKS, Hinckley, Ill.

*Every day
Any Garage:
Just received
your monthly
statement and
note you have
overcharged us
for repair work
(Any) Motorist*

This would not happen with a CALCULAGRAPH



It records and prints the actual elapsed time on repair jobs—eliminates errors and prevents disputes.

The easiest, quickest way of computing repair charges.

Write today for booklet No. 11, describing a simple garage cost system.

Calculagraph Company
Dept. 77
30 Church St.
New York

KENNEDY Auto Storage Covers

furnish efficient protection for cars in dead storage. They are made of strong, heavy paper, properly reinforced, and in standard sizes to fit any car.

Made only by

THE KENNEDY CAR LINER & BAG CO., Shelbyville, Ind.

AUTOMOBILE SPRINGS
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.



HAYWOOD'S LATEST INVENTION

Here it is:

A new machine that will earn from \$100.00 to \$150.00 per week in any well-established tire repair shop. More than one year of constant experimenting and development work was required to complete it.

Statistics say there will be **One Billion Dollars'** worth of tires worn out this year. The insistent demand for re-treaded tires that would add 3,000 to 4,000 more miles of wear is growing. A new and better machine than had so far been produced was needed.

HAYWOOD'S
Silvur Lined
MOLD

meets the need. Made of white metal—die cast—absolutely free from blemishes and smooth as glass. It is truly a wonderful machine.

Old tires retreaded on this machine closely imitate the runner, **cord type**, and are smooth, classy, bright. All 4,000 owners of Haywood Tire Repair plants will **want** this new Haywood invention. Owners of other plants should have one.

**PAYS FOR ITSELF
IN A WEEK**

Will earn from \$100.00 to \$150.00 weekly. Are you an auto tire repairman? If you are not, why not enter this profitable business? Tire repairmen earn **\$2,500 to \$4,000 per year**. Many are doing better; some up to \$6,000 and \$7,000 per year. If you have a tire repair shop you need this Haywood Silvur-Lined Retread Mold. You should write us at once and get the details. It will pay for itself in a week. Every week thereafter you should make \$100.00 or more extra profit.

FREE BOOK

I have an interesting book to send you that tells about tire repairmen and the Haywood method. It tells about automobile tires—it gives inside facts that you should know about profits. When you write tell me if you have a tire repair shop, or, if you want facts about the tire repair business. Address

I have an interesting book to send you that tells about tire repairmen and the Haywood method.

WRITE ME!

I will tell you how to start in business as an expert tire repairman and earn \$2,500 to \$4,000 per year. Sounds too good to be true. But it is true, every word of it.

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., INDIANAPOLIS, IND.

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., Indianapolis, Ind.
(Mark an X for interest in either or both subjects)

- ☐ Send facts about the Silvur-Lined Mold.
☐ Send facts about the Tire Repair business.

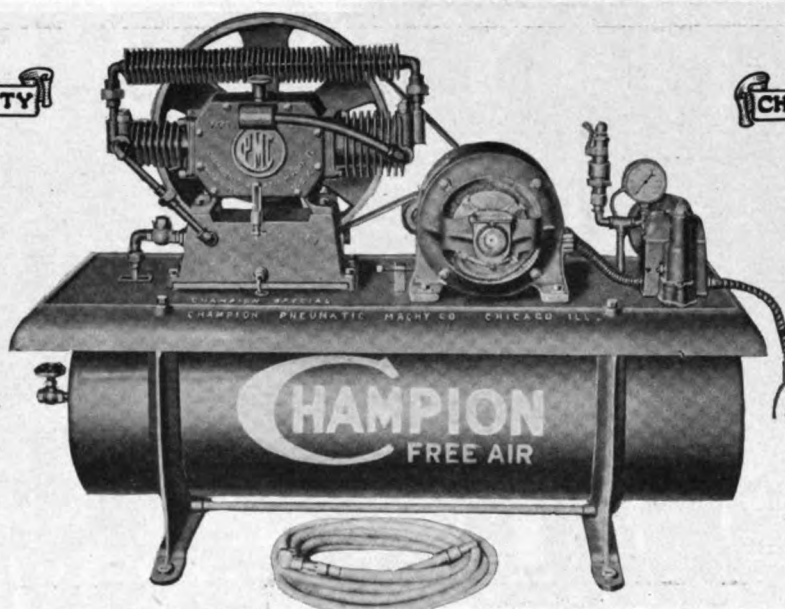
NAME

ADDRESS

**SILVUR
LINED
RETREAD
MOLD**



N. E. Gibbard, Charlotte, Mich., owner of a Haywood plant, last year did a business of \$15,000. Charlotte is a town of 7,500 population.



THE CHAMPION SPECIAL AUTOMATIC AIR UNIT

SHIPPED ON APPROVAL

The well known

CHAMPION AIR COMPRESSOR

(The Fastest Two-Stage Air Compressor Ever Built)
(OF ITS SIZE)

READ THESE SPECIAL FEATURES

- 1 Valves: Mushroom Type, housed in bronze cages. Special arrangement for re-grinding.
- 2 Crank-Shaft: Drop forged, 1 1/4 inches in diameter.
- 3 Connecting Rod Bearing: 1 1/4 x 1 1/4 inches, bronze back, babbit lined.
- 4 Main Bearings: Hess-Bright ball bearing.
- 5 Connecting Rod: I-beam type with inserted wrist pin bushing.
- 6 Lubrication: Automatic splash insures perfect lubrication.

That is exactly what we mean! We will ship you our latest design Champion Air Compressor on **30 Days' Approval**, because we have confidence in its performance, and know that after you have tried it, you will say, "The Champion is the air compressor we want."

Irrespective of whether you pay cash or buy on open account, when you order a Champion Air Compressor you have the privilege of testing it for 30 days in actual service. Then if it does not "prove up" we will take it back and refund you any money paid on account.

BUY ON EASY PAYMENTS! *If you wish*

You can buy the Champion on easy monthly payments if you desire. Simply make a reasonable first payment, and we will carry the balance to suit your convenience. No trouble to you and no red tape.

READ OUR BINDING GUARANTEE!

Our guarantee is broad and protecting to you. In part it says: "The Champion Pneumatic Machinery Co. hereby guarantees that the material used is of the best kind of quality suitable for the purpose. It guarantees the workmanship and finish to be of high class and that the apparatus will be capable of operating, as guaranteed. It also expressly agrees to replace free of charge, any part developing inherent defect under normal and proper use, within the period of TWO YEARS from date of sale, providing the purchaser gives the company immediate written notice of such defect and returns such defective material to factory, all transportation charges prepaid."

ILLUSTRATED BOOKLET SENT FREE

Simply Write or Mail Coupon

Just fill in the coupon with your name and address and mail, or write us a letter or postal, and we will send you our complete descriptive literature. Booklet explains how the Champion is made and operates. Every feature is illustrated. Remember you are under no obligation. Detach and send coupon today, because it's the air compressor that will please you.

**The Champion Pneumatic
Machinery Co.**

1402 S. Michigan Ave.

CHICAGO, ILL.

MAIL
COUPON

**The Champion
Pneumatic Machinery
Co., 1402 Michigan Avenue
Chicago, Illinois.**

Gentlemen:—Please send us your *free* descriptive booklet on the Champion Air Compressor.

Name _____

Address _____



Oplex Signs Leave No Doubt as to Where the Goods Can Be Bought

MANY dealers in cars and accessories are losing out because people do not know where the goods they handle can be bought. They know the line through its advertising, but they do not know where it is sold.

This cannot happen if you have an Oplex Sign—raised, snow-white letters on a dark background—a perfect day sign as well as an electric night sign.

Among the advantages of Oplex Signs are:

- Raised white letters.
- Day and night effect.
- Greatest reading distance.
- Most artistic effect.
- Most for the money.

If you will let us know something of your sign needs we shall be pleased to send you a sketch showing how your sign will look.

THE FLEXLUME SIGN CO.

ELECTRICAL ADVERTISING
Niagara St. and Potomac Ave., Buffalo, N.Y.

Pacific Coast Distributors:
Electric Products Corp., Los Angeles, Cal.

Canadian Distributors:
The Flexlume Sign Co., Ltd., Toronto, Can.

American Garage & Auto Dealer

Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

OCTOBER 1919

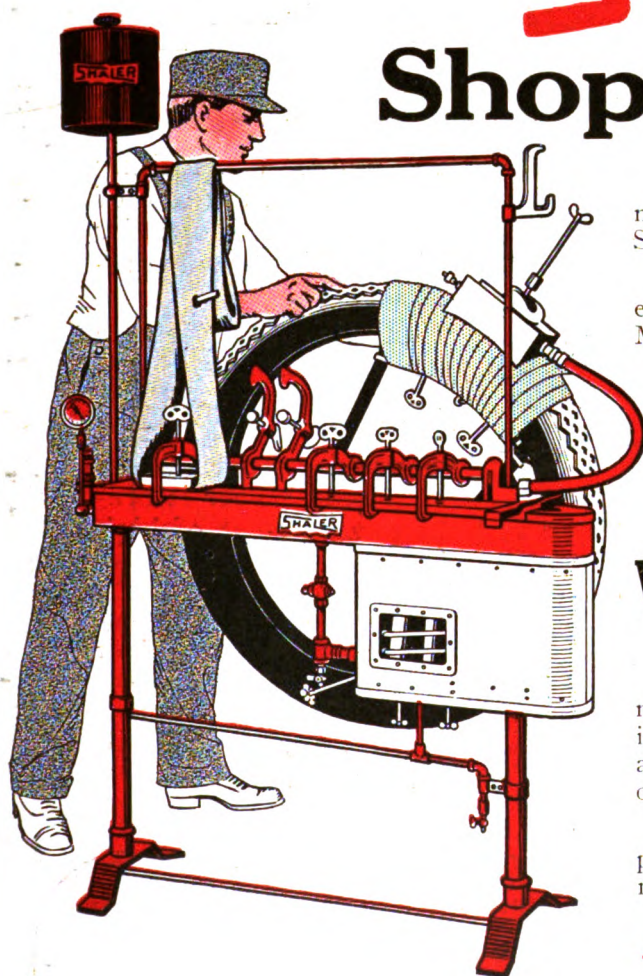
Vol. 10—No. 10
10 Cents the Copy
\$1.00 Per Year

Make Money Repairing Tires

With a

SHALER

Shop Vulcanizer



Thousands of repairmen are making \$200 to \$500 and more a month clear profit, repairing tires with the SHALER Steam Vulcanizer.

It will do as much and as perfect work as the large, expensive vulcanizing outfits that cost \$250 to \$500. Mends up to 12 Casings and 200 Tubes in a day. Handles any size or style of tire—both casings and tubes.

Anybody can quickly learn to operate it—we furnish tools, material and all the instructions you need.

Uses the Famous WRAPPED-TREAD Method

The Wrapped-Tread Method is used by nearly all tire manufacturers in making tires. It repairs every casing injury that it is practicable and profitable to undertake, and does it quicker, better and at less cost than any other method.

With the SHALER Automatic Heat Control it is impossible to overcure or undercure a tire—furnishes the right heat without watching or regulating.

Ask your jobber—Write for catalog

Type "N. P. R." Price **\$70**
Subject to Trade Discount

of the complete line of SHALER Vulcanizers for Repair Shops, Garages and Motorists' Use.

C. A. Shaler Co., 359 Fourth St., Waupun, Wisconsin, U. S. A.

OLDEST AND LARGEST MANUFACTURERS OF VULCANIZERS IN THE WORLD

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Sell Inland One-Piece Piston Rings

Dealers the world over are making unusually good profits on the sale of Inland One-Piece Piston Rings for every type and size of internal combustion engine.

Inland sales-winning superiorities are due to the patented one-piece, Spiral Cut principle of construction. Inlands maintain a positively gas-tight seal between pistons and cylinder walls. The waste of fuel and power is prevented and the development of high compression is accomplished.

Inland Piston Ring sales are on a basis of millions per year. If you are not selling Inlands you are missing fine profits. Ask your jobber about Inlands—keep your stock complete.

Inland Machine Works

1645 Locust Street
St. Louis, Mo.



INLAND

ONE-PIECE PISTON RING

For Fords, Overlands, Studebakers
Here's the Answer

TUNGSTEN

TRADE MARK REGISTERED

$\frac{1}{2}$ -inch for
F. O. S.

The Reasons Why



TRY IT at our expense in the worst oil pumping front cylinder you can find

This New Type Tungsten Will Stand More Oil and Carbon Without Shorting Than Any Plug You Have Ever Used and We Will Prove It to You.

READ THE COUPON

OWNER'S COUPON

Tungsten Mfg. Co.,
 Marshalltown, Ia.

Send me one of your new Tungsten $\frac{1}{2}$ in. Special F. O. S. prepaid, for which I enclose

\$1.00 Stamps
 Currency

Dealers name is

Name

Town..... State.....

A. G. & A. D.

TUNGSTEN MFG. CO.

MARSHALLTOWN
 IOWA

Attach This To Your Letterhead
 DEALER'S COUPON

Tungsten Mfg. Co.,
 Marshalltown, Ia.

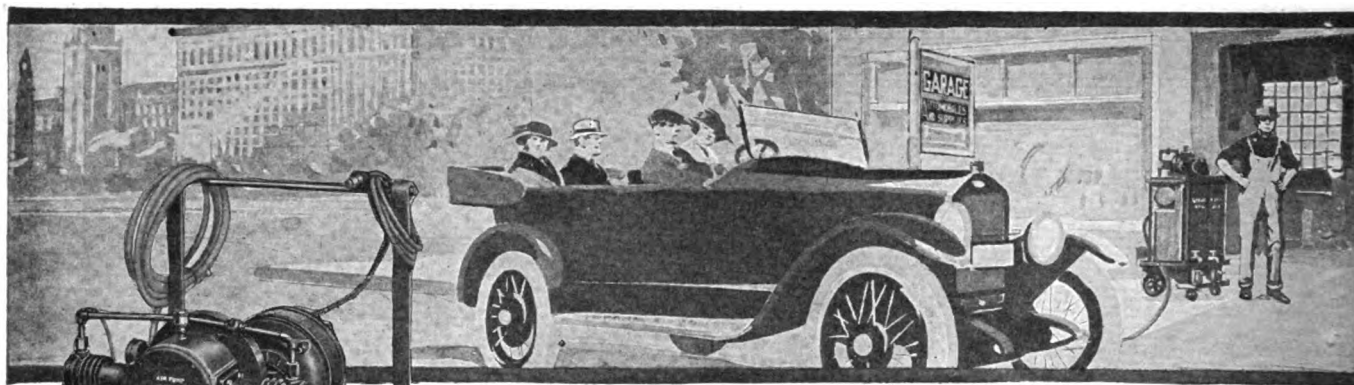
Send us, without obligation, one of your new Tungsten $\frac{1}{2}$ in. Special F. O. S.

Name

Town

State

A. G. & A. D.



**Eight Years of Successful Service
Has Won Them an Enviably Reputation
For Economy and Efficiency**

THE use of a Two-Cylinder General Air Compressor in your garage or service station gives you the best assurance obtainable of a reliable supply of cool, clean air—seven days a week—at rock bottom cost.

Your savings on account of its low operating expense and light upkeep and repair cost will more than repay you your original outlay. From no other compressor can you get the economical, trouble proof, highly efficient service these wonderful little outfits will give you.

Two Cylinder
**GENERAL
AIR COMPRESSORS**

Their capacity is 5000 cubic inches per minute. They inflate an average sized tire in 2 minutes at the lowest possible cost.

Jobbers in territory in which we are not represented will find it to their interest to write for our distributor proposition.

Dealers, write for the name of our exclusive distributor in your territory. He can make immediate delivery.

Our booklet—"The Low Cost of Cool Air"—tells you all about our line



Our Utility Model combines an air compressor, air tank and oil service.

The presence of the oil service—without a word from you—automatically sells the motorist oil.

UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

Factory 1324 Ogden St. Philadelphia - Office 809 New Stock Exchange Bldg., Philadelphia

Utilities that Sell Because They Serve

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers

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^{ZELNICKER} *Ever-Tyte* The Piston Ring for All Engines

A Guarantee Against Motor Troubles

Be particular to install the right kind of Piston Rings for your customer. There are many on the market. But there is only one *ZELNICKER Ever Tyle*. One that has an ironclad guarantee that will satisfy the most skeptical. One that will back you up to the limit. It is reproduced here. Read its sweeping liberal terms.

ZELNICKER Ever Tyle Piston Rings have six point circular expansion and Zelnicker's Patented Right Angle Interlock which prevents loss of compression, gas or oil leaking by or passing through.

They make snug contact with the cylinder walls with minimum friction.

Their design is based on sound mechanical principles. Therefore their results cannot be otherwise than perfect.

What's more, there's a big whirlwind advertising campaign to help you make sales.

The most influential publications, with over 17,579,284 responsive readers, will see these pertinent Piston Ring messages.

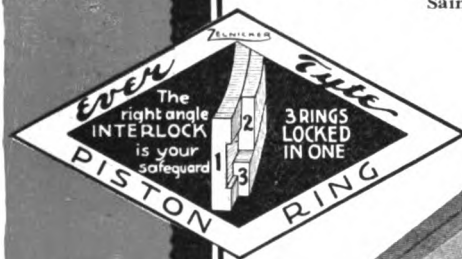
The following magazines will carry full pages:

| | |
|-----------------------|--------------------|
| Saturday Evening Post | Successful Farming |
| Literary Digest | Country Gentleman |
| Progressive Farmer | Sunset Magazine |

Satisfied customers and bigger profits for you.

Write for our proposition.

THE EVER TIGHT PISTON RING CO.
Saint Louis, Mo.



Read
The Guaranty Bond

GUARANTY BOND

We guarantee *ZELNICKER Ever Tyle* Piston Rings to produce higher compression, develop more power, and use less fuel and lubricating oil, you to be the sole judge.

We will refund the full purchase price to any purchaser upon the return of the rings if they fail to give absolute satisfaction within a period of twelve months from date of installation.

THE EVER TIGHT PISTON RING CO. ST. LOUIS

No. 1,628,241

W. Zelnicker
PRES.

"NORMA" PRECISION BALL BEARINGS

(PATENTED)



When a car, a truck, a tractor, or a power boat fails—be it from the failure of ever so small a part—the owner's condemnation covers the unit as a whole. And he puts the responsibility for the failure squarely up to the builder of the unit to whom he paid the price—not to the maker of the defective parts.

A realization of this fact, on the part of builders of automotive units and electrical apparatus therefore explains the vast preponderance of "NORMA" equipped magnetos and lighting generators in the automotive world. Responsible builders know that "NORMA" gives security against bearing troubles.

**Be Sure—See That Your
Electrical Apparatus
Is "NORMA" Equipped**



THE NORMA COMPANY OF AMERICA
1790 BROADWAY NEW YORK

Ball, Roller, Thrust and Combination Bearings

American Garage & Auto Dealer

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|------------------------------|----|
| The National Peril..... | 9 |
| Support the Dyer Bill..... | 9 |
| Solicit Winter Work Now..... | 11 |
| Watch Your Losses..... | 11 |

GENERAL

| | |
|--|-------|
| Individuality in the Commonplace, by A. Owen Penney | 12 |
| How Dreams Brought Dollars, by Arthur S. Ballard | 13-14 |
| Records Simplify Tire Adjustments, by Robert J. Burdette, Jr. | 15 |
| Method of Cutting Threads on Lathe, by J. N. Bagley | 16-17 |
| Law on Disobeying Shop Rules, by Chelsea C. Sherlock | 18 |
| Fast Work and Courtesy Win Success, by James F. Hobart | 20-21 |
| The Features of Farm Electric Plants, by E. C. Pohlmann | 21-23 |
| Fall Automobile Accessories Drive, by Earnest A. Dench | 28 |
| Tentative Chart of Accounts Set Up, by J. Newton Boddy | 31-34 |
| Dairy Grows with Its Truck Fleet..... | 34-36 |
| Moving a Stock Room to an Office..... | 38-42 |

DEPARTMENTS

| | |
|--|-------|
| Practical Hints for Shop Mechanics, by E. C. Pohlmann | 24-25 |
| Welding, Cutting and Brazing Practice, by David Baxter | 26-28 |
| Readers' Questions and Answers, by E. C. Pohlmann | 29-30 |
| Facts and Ideas for the Tire Dealer..... | 46-50 |
| From the Truck and Trailer Field..... | 52-54 |
| Accessories—They Bring In Money..... | 56-58 |
| Garage Equipment for Better Efficiency..... | 60 |
| News of Manufacturers and Jobbers..... | 62-66 |
| Buyers' Reference | 76 |
| Index to Advertisers..... | 77 |

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AMERICAN GARAGE & AUTO DEALER, Inc.
116 S. Michigan Avenue, Chicago, Ill.

J. R. HASTIE, *President and Treasurer*

H. D. FARGO, *Vice President* E. C. HOLE, *Vice President*
E. T. CLISSOLD, *Vice President* S. R. EDWARDS, *Secretary*

S. R. EDWARDS, *Editor*.

E. C. POHLMANN, *Assistant Editor*.

G. M. ALLEN, *Mgr. Copy Department*.

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Subscription per Annum (Postage Paid) \$1.00. Advertising Rates on Request.



DENBY

MOTOR TRUCKS

DEALERS!

There are big opportunities in merchandising Denby trucks; maybe there's some open territory in your section. A letter to the factory will post you.

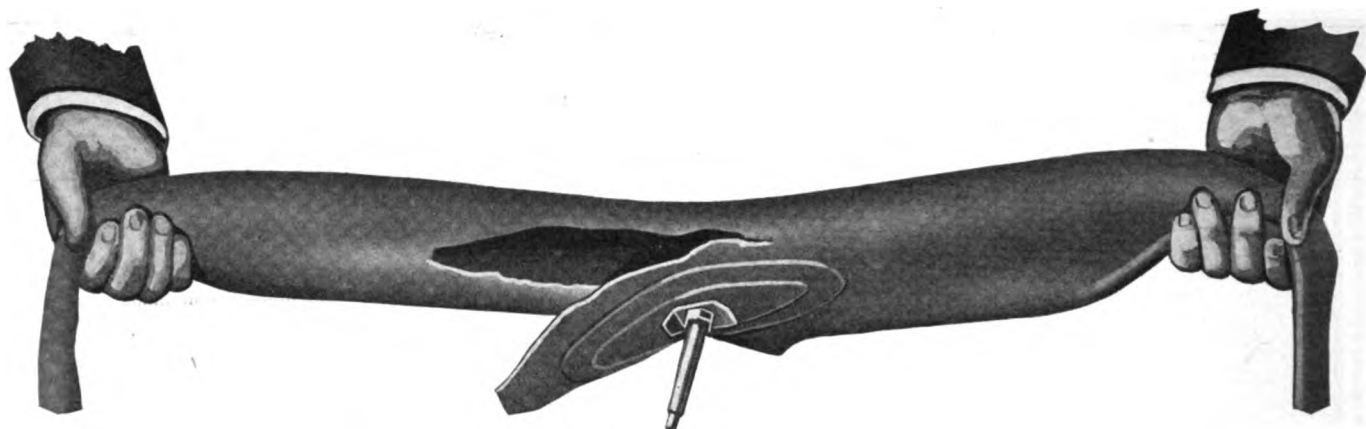
DENBY TRUCKS have won for themselves a reputation for doing easily the tasks that have proved impossible to other trucks,—of delivering transportation dependably, and at a cost that makes operation profitable, under conditions that were seemingly prohibitive.

The same features of design and of construction that give them this greater ability, insure a very long life and low maintenance under ordinary conditions of service.

Any Denby dealer will gladly show you the reasons for the better service Denby trucks give.

Denby Motor Truck Company—Detroit

(41)



Mr. Dealer! Think a minute! What have *YOU* got in stock that will mend *this* tear?

You'll admit that this would be a difficult job for a vulcanizing or patching outfit—but it's a **CINCH** for TIRE-DOH.

When your customers ask for tire repair material you are giving them what they ask for, WITH GOOD MEASURE, if you sell them TIRE-DOH.

The "Before" and "After" illustrations herewith are made from actual photographs of a torn tube which, after being repaired, gave thousands of miles of service.

TIRE-DOH will make all kinds of tube repairs as well as keep casings in good condition. It's easy to use, economical and the repairs are permanent. We guarantee it to give satisfaction.

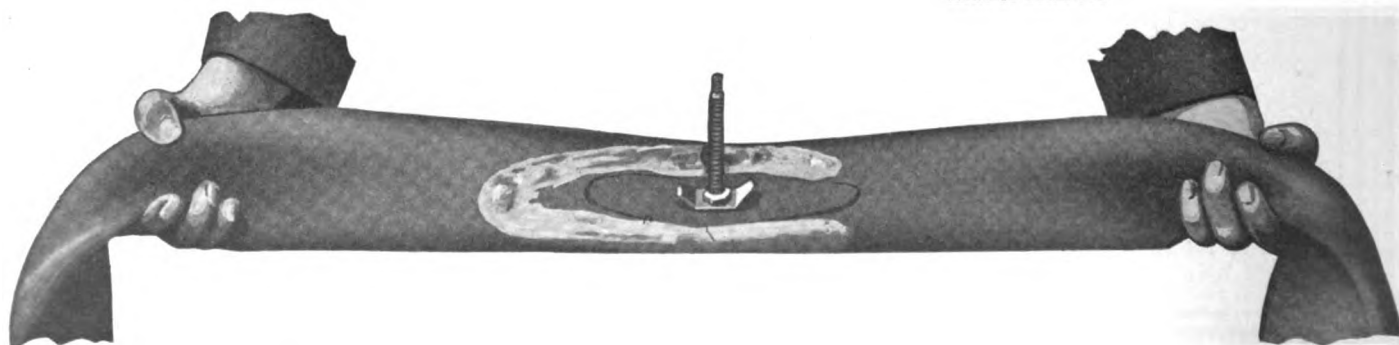
Write us for particulars.

Atlas Auto Supply Company
680 W. Austin Avenue CHICAGO



The Genuine TIRE-DOH Outfit consists of One Can TIRE-DOH and One Can TIRE-DOH Cement.

TIRE-DOH Repairs Anything that is Rubber.



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

American Garage & Auto Dealer

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

Vol. X. No. 10

CHICAGO

October, 1919

The National Peril.

In these days of world unrest, we read of many plans and remedies set forth by self-nominated leaders which, though fundamentally unsound, find enthusiastic supporters among unthinking people who believe they see easier ways of gaining their livelihood than by sticking to the old-established fundamentals. Upsetting or breaking of established laws is advocated under various disguises, but such courses only lead to anarchy.

The people of this country will never tolerate an autocracy of Wealth, such as is feared by many agitators. On the other hand, they will not tolerate an autocracy of

Labor which is evidently being attempted by some radical elements of the various labor unions.

Any such attempts are ordained for failure just as attempts to establish complete democracies of government and complete monarchies have failed and are failing.

The recent histories of Germany and Russia are striking examples of extreme autocracy and extreme democracy. The United States is a government which lies between these two extremes. It is declared by those qualified to speak authoritatively on

the subject that the men who wrote the Constitution of the United States did for the science of government exactly what was done for the science of mathematics when the ten digits were developed.

"Any deviation from our Constitution," declared Major General Wood a few weeks ago, "is a step in the direction of anarchy."

While production in this country is

workman is apparently overlooking this, being intent only on reducing hours of labor and increasing his rate.

Irresponsible union labor leaders are stirring up all the trouble possible, and the net result is a cut in production that keeps up high costs, injures our country and plays into the hands of its enemies. The sooner the idea is rooted in the minds of the people that this labor unrest, fomented

by foreign radicals, is a dangerous attack on American institutions, the better it will be for all of us.

If the doctrine of adhering closely to the constitution and increasing natural production is preached and practiced more, the United States will

again soon enjoy a full measure of peace and prosperity.

Support the Dyer Bill!

All over the country, automobile owners, dealers, and good citizens generally are expressing approval of the proposed anti-theft bill. This bill which is now before Congress, as our readers know, provides a fine of \$5,000 and up to five years in a federal prison for transporting a stolen automobile from one state to another.

The bill has been passed by the House of Representatives by a vote

HOW THE HOURS ARE SHORTENED

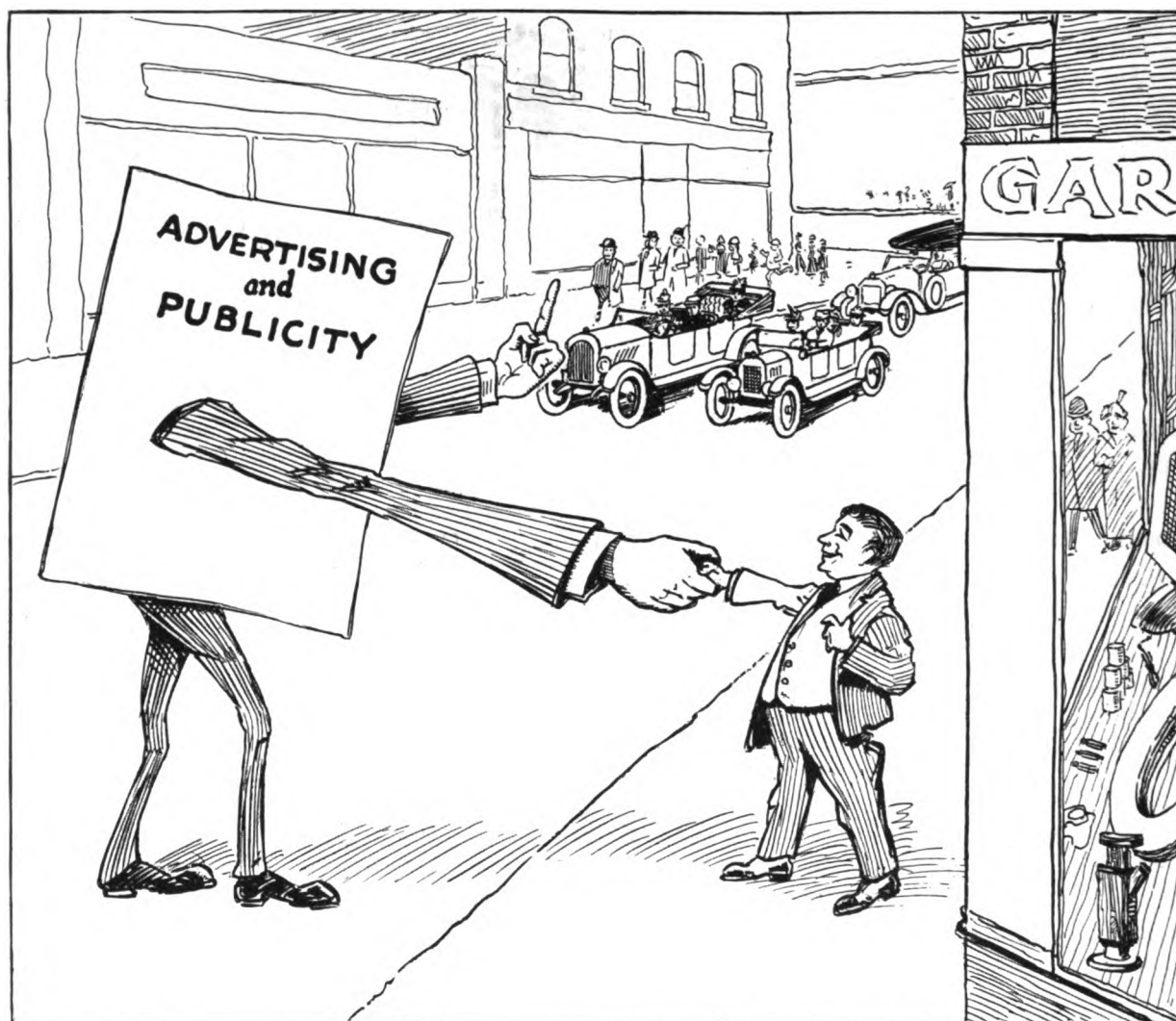
Eight working hours, just now, looks like a dream of He'vn,
But some fine day, not far away, the dream'll call for seven.
Seven working hours a day; then boss can easy fix
His prices high, so by-en-by we kin get off with six.

Six working hours a day; why, lawdy sakes alive!
Now what the deuce kin be the use of working more than five?
Five hours to work; that's fine and proper to be sure;
At this here rate our delegate kin work 'em down to four.

Four working hours a day, and then we are all through;
But truth to tell, we might as well just cut it down to two.
Two working hours a day, I'm here to say that is by far too many,
I move to strike, and then, Sure Mike! we'll quit and won't work any.

delayed and curtailed by strikes and demands for shorter working hours, we hear of the tradesman and laboring man in Germany working 14 hours a day to obtain the increased production so essential in bringing about more stable conditions and lower prices of commodities. This is a hard fact that should make American business man and the American workman do some serious thinking.

The business man is thinking of it, for he knows that increased production in Germany means sharp competition for the world's markets, but the



The Intimacy of Advertising

Successful Business Building demands continuous advertising and publicity effort. No merchandising business has ever been successful except with the aid of advertising and publicity ideas.

The reputation of many automobiles, trucks and automotive accessories is to a large extent dependent upon the manner in which publicity was used. Of course, there are ways and ways of using publicity and advertising—and the manner in which they are used determines the results. There's a certain intimacy about advertising and publicity which brings in prospective customers.

You have met the man who is cold and whose handshake expresses no warmth or friendliness whatever—he's never a success as a salesman or business-getter. Then there is the friendly chap, whose very appearance arouses in those he meets a desire to become better acquainted. That really is the purpose of all publicity and advertising effort—to get people to know you and your product better.

It's the relationship resulting from the proper use of publicity and advertising that carries over the rough spots. It brings the patrons back to deal continuously with the house so fortunate to realize the intimacy-creating power of advertising and publicity.

of 200 to 40, and is now under consideration by the Senate. Undoubtedly, the Senate will take favorable action, but—we know how slow congressional action is.

The sooner it is passed, the quicker will an effective curb be placed on the stealing of automobiles. In 1918, automobiles to the value of \$28,000,000 were stolen in 21 of the larger cities, and at the present time the daily average in Chicago alone, is 15 cars.

Automotive dealers have an influence in their communities. A few words, judiciously spoken, can stimulate action—and Congress is very sensitive to the voice of its constituents. Telegrams and letters to senators from their constituents will receive attention, especially if they come from prominent people in the various communities in their states.

The Dyer Bill, H. R. 9203, belongs to what is termed "emergency legislation." Telegrams and letters from automotive dealers and their friends to their senators asking them to vote for the Bill will aid in hastening its passage through this session of Congress. Automotive dealers have a personal as well as a moral interest in the enactment of this bill into a law. A cutting down in the thefts of automobiles means the elimination of sales of automobiles, tires and accessories at prices below the market.

Solicit Winter Work Now.

Automotive merchants who have repair shops or service stations where small mechanical jobs can be done, should be making preparations now to keep their forces of mechanics busy during the colder months when ordinarily there would be little for these men to do. One thing to do is to start keeping track of cars in need of overhauling so that in a month or so when the owners are not using them as constantly as during the

warmer months it will be possible to get this work into the shop when the shop proprietor solicits the owner.

One good plan to follow is to begin right away a campaign to get a lot of repair work during the winter months. If owners are approached now and told that their cars would run better if some needed repair work or over-

The Glory of Work.

By Angela Morgan.

WORK!

Thank God for the might of it,
The ardor, the urge, the delight of it—
Work that springs from the heart's desire,

Setting the soul and the brain on fire.
Oh, what is so good as the heat of it,
And what is so glad as the beat of it,
And what is so kind as the stern command
Challenging brain and heart and hand?

WORK!

Thank God for the pride of it,
For the beautiful, conquering side of it,
Sweeping the life in its furious flood,
Thrilling the arteries, cleansing the blood,

Mastering stupor and dull despair,
Moving the dreamer to do and dare.
Oh, what is so good as the urge of it,
And what is so glad as the surge of it,
And what is so strong as the summons deep,
Rousing the torpid soul from sleep?

WORK!

Thank God for the swing of it,
For the clamoring, hammering ring of it,
Passion of labor daily hurled
On the mighty anvils of the world;
Oh, what is so fierce as the flame of it,
And what is so huge as the aim of it,
Thundering on through dearth and doubt,
Calling the plan of the Maker out;

WORK, the Titan, the friend,
Shaping the earth to a glorious end;
Draining the swamps and blasting the hills,

Doing whatever the spirit wills,
Rending the continent apart,
To answer the dream of the Master heart.

Thank God for a world where none can shirk,

Thank God for the splendor of work.
(From the Chicago Labor News, September 1, 1919.)

hauling was done, a good many of them will agree to send their cars in to the shops during one of the cold months. If the shop owner will make it his business to get after this repair and overhauling work now, he will undoubtedly be able to so arrange matters that he can obtain considerable of this work which can be done without any need for hurry at

a time when ordinarily the force of shop mechanics has been reduced and even these fewer men are idle or busy only a portion of the time.

Watch Your Losses.

"Your father, years ago, gave me a business principle to which I attribute the success which I have attained." The speaker was a business man from one of the smaller places in Missouri and he was talking to a son of a successful Chicago business man. The principle which he had followed, he expressed in these words:

"Know what your losses are—your profits will take care of themselves."

This is a fundamental principle which applies to business of all kinds. Unfortunately, it is one that is not followed by many business men.

Only a few years ago the Federal Trade Commission, after an extensive investigation of various industries, discovered that only about 20 per cent. of the business men of the country were in position to tell what their actual business was, and whether or not their operations were conducted on a profitable basis. So surprising was the lack of proper accounting and bookkeeping methods, that the commission suggested a system of accounting to aid in placing business generally upon a better foundation.

The value of proper accounting methods is not generally appreciated, although recently there has been a general awakening as to the necessity of having exact information concerning the operations of a business. Many concerns believed they were doing a business at a profit, but when submitted to the rigid tests of proper accounting, they discovered that losses entirely unsuspected were absorbing most of their supposed profits. They did not know their losses—their eyes were turned in the opposite direction. Do you keep your eyes on your losses?

Individuality in the Commonplace

Few Automotive Dealers Take Advantage of the Power of Beauty—It Is an Advertisement—Just as the Autoist Turns into the More Inviting of Two Roads, So the Public Seeks the Attractive Places in Which to Deal

By A. Owen Penney

The average service station consists of a cinder driveway, a pump, and a little galvanized-iron hut, sometimes painted, sometimes not. It seems to serve its purpose and the proprietor nevertheless appears to be making more than a living.

When the writer one day stumbled on a "gas depot" that looked like the entrance to some millionaire's private grounds, the shock of surprise took his breath away. When he recovered his poise, he studied the place in detail to discover how its effect had been secured.

It was located on a corner, well within the business district, but just off the main arteries of traffic. It was,

up. It was a lot of fair size, perhaps 50 by 60 ft. The north and east sides were flanked by buildings, of which one to the east belonged to the station and was used as a salesroom for accessories.

Close beside this building was a cement pavement where a car might stand while the tires were being inflated or minor repairs being made. Against the building to the north was a space where a limited number of autos might be parked at a small rental.

The remaining yard surface was coated with crushed stone, rolled hard and smooth. In a convenient spot stood two gasoline pumps, with

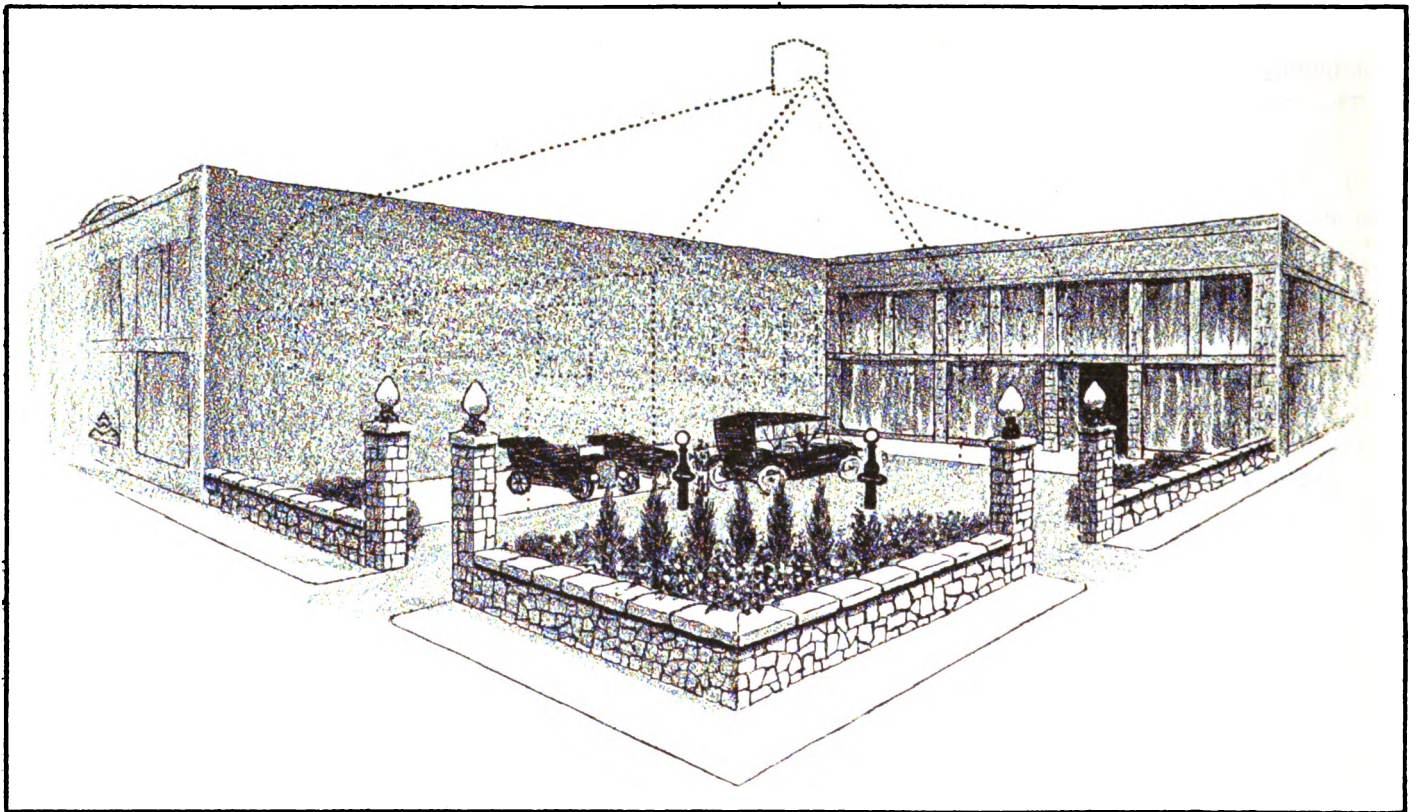
individuality to the commonplace.

The salesroom just mentioned had been remodeled and painted a warm tint of buff with green trimmings.

The outer borders of the lot—that is, the sides bounded by the streets—were marked by a low wall of light gray stone, with rough top.

Where the driveways cut this wall stood massive stone gate posts, beautiful in their symmetry and topped with ornamental electric lights. The posts were made of the same light grey stone as the walls. The masonry of the posts and walls was perfect.

Across the corner of the lot, the wall was built to enclose a triangular



How a Pile of Debris From a Ramshackle Structure Was Utilized to Beautify the Unbeautiful and Impart Individuality to the Commonplace.

therefore, convenient and accessible to all motorists.

The writer remembered that this corner had formerly been encumbered by a ramshackle structure, and that after it had been razed by order of the building inspectors, the resulting pile of debris was even more hideous than the original house.

The ground had now been cleaned

an approach from each of the intersecting streets, and with ample space for maneuvering.

So much for the background and for the customary and essential features. What I am now about to describe was strictly non-essential, yet important to a high degree, because it indicates how easy it is to beautify the unbeautiful and impart a distinct

space. This was filled with earth nearly to the level of the coping, and here had been planted a bed of flowers and small evergreens. Plants and shrubbery also grew just inside the remainder of the wall wherever space permitted.

In an environment of general unloveliness this little spot stood out as a veritable oasis of beauty. The

warmth and brightness of its color scheme contrasted agreeably with the dullness of the surroundings, making it the most attractive corner for blocks around.

While the attractive power of beauty is appreciated by certain classes of business men, it is nevertheless surprising what few lines have taken advantage of it. The influence of beauty is a positive one anywhere. It is an advertisement. It attracts. Just as an autoist, on pleasure bent, turns

into the more inviting of two roads, so the general public, other things being equal, seeks the most attractive places in which to deal. The purchaser of "gas" is no exception to this law of nature. He likes to go where it is pleasant to go, where entrance and exit are easy, where the surroundings suggest something more than the mere utilitarian purpose of the place.

A service station of pleasing appearance has the further merit of be-

ing a booster for your city. After a recent tour through the Middle West, one city in particular stands out conspicuously in the writer's memory for its large number of these pretty and conveniently-appointed places of supply. Travelers will likewise remember your own city for its charm or the lack of it. Your town gives you a living. In return you ought to give its reputation your loyal guardianship. The influence of the service station is worth considering.

How Dreams Brought Dollars

One Man Dreamed Ideas for Increasing Business, but His Suggestions Were Accepted With Amused Tolerance—He Finally Saw the Practical Side of Air-castle Building, Went into the Garage Business and Made Good

By Arthur S. Ballard

Fred Williams had surprised the whole town. With but a little capital and less experience in the automobile field he had established the most successful garage in town and was doing a very tidy accessory business. The other day I met him in a restaurant and during the meal I asked him how he had accomplished this in the face of the keen competition that already existed.

He smiled when the question was put to him. "My business," he answered, "is the result of an experiment. You know that while I was still clerking at Howard's, I was considered very much of a dreamer. Whenever I suggested changes in the business sales methods and policies, the suggestions were received with amused tolerance.

"I remember hearing Mr. Howard remark to the general manager one day that I had possibilities and that I might develop into a pretty good man if I would only stop dreaming. That hit me right where I lived. I began to wonder if I were really standing in my own way by advancing my pet theories, or whether I had the right idea after all. I thought this over for three days and finally decided that I would defend these pets of mine if it cost me my job.

"One day Mr. Howard casually remarked to me that 'The Fair' was getting some of our business and that he couldn't see why; for our merchandise was as good as theirs and was a little cheaper.

"'Mr. Howard,' I ventured, 'I believe I can tell you why they are getting our business—we are merely selling merchandise—'

"'Of course we are!' he thundered, 'What of that? It's good merchan-

dise, isn't it? And a darned sight cheaper than theirs!'

"'But they are not selling merchandise,' I retorted, 'they are selling service and throwing in the merchandise in the bargain. I believe we all buy service. When you or I go out to get a phonograph, we do not purchase a machine. What we actually buy is the pleasure that machine will afford us—in other words, we buy the service it renders.

"'In nearly every instance we buy a service, not an article. When a woman goes into a dry goods store like ours, she is willing to pay for courteous treatment, appreciates the clerk's effort if he offers her help in selection. Deliveries, charge accounts, restrooms—these are all service and they have a dollars-and-cents value. That is where The Fair has the bulge on us—they are selling service. We are selling merchandise. That is only one of the ways in which The Fair gets the jump on us.'

"I was very excited at the time and I guess I made the old man pretty peeved. He came back at me right away.

"'If you are so cock-sure that these wild theories of yours are right, why don't you put them in practice yourself? It is one thing to suggest these radical changes on another man's money—perhaps if it were your own, it would change your ideas.'

"That decided it for me. 'I will,' I answered. And I did.

"When I first started this business, my friends began to feel sorry for me. The very first thing I did was to try, to make the place attractive and inviting. That cost money. Then I put in considerable time and effort to get a list of names of car owners, tractor

owners and prospective car and tractor owners. That also cost a little money, and, considering the limited amount of capital I had, my friends thought I was foolishly plunging. However, it has since proven that those two moves were responsible for a good part of the business that I rapidly secured. Today they are the most valuable assets I have and are worth many times their cost.

"I got every bit of advertising literature that the manufacturers whose goods I carried would supply. I figured that if it were worth an expenditure of thousands of dollars to them, it would surely be valuable to me.

"At regular intervals we send out advertising literature and sales letters to our entire mailing list. We are guided by the season in many instances. For instance, in fall and winter we try to put most of our sales effort behind such articles as anti-skid chains, heaters, chain tighteners, and other articles that are particularly adaptable to winter conditions. In the spring and summer, we cover everything we carry that will better the efficiency of a car.

"This circularization is our business mainstay. I purposely stopped all advertising for a month, in order that I might see just what this advertising meant to us. And, when we resumed it again, the increase in business was so marked that I have decided that as long as I am in business, I will send out advertising matter as religiously as I send out my invoices and statements.

"Service was the keynote of my business. Whenever I hired a new man I made that clear to him. That extended not only to the customer and to the business, but I also made it

profitable to the men. We had weekly conferences, when we went over the happenings of the week, offered new suggestions to better conditions and the business. We weeded out all old methods that were proving unprofitable.

"Then we went over all the advertising literature we had, in order to familiarize ourselves with every feature of the goods we carried and became so conversant with these goods that we would have each distinct selling point at our finger ends.

"These conferences had a tendency to 'pep-up' the men, and to create the feeling that we were all working together for our mutual benefit.

"I kept after the men to remember that there was another phase of service that we could render which would mean more business for us and ultimately more money for them. I asked them to bear in mind that our business was more than an 'order-filling' business and that it was up to us to discover the customer's needs and supply them.

"Whenever there was a car in the place, or we were doing a repair job, I had them keep their eyes open. If they saw a part that would need replacement in the near future, or that the car lacked an accessory which would improve it in appearance or efficiency, they made a note of the fact. Then I would look over the list.

"If Wilson's front spring was reported in poor condition, I would mail him the literature that I had received from the spring manufacturer. Or, if the list showed that Smith's Ford car lacked a shock absorber, despite the fact that he had to travel a rocky road every day, I would send Smith the shock absorber circulars.

"With the advertising matter, I would send each a personal letter, stating that it occurred to me that they might be interested in the article, and that I was sending them the literature in order that they might learn something of the value of the article to them in efficiency and economy.

"We tied up our place with the national advertising of the lines we carried. Through our windows, shelves and walls, we tried to make every one who passed our place, or came in, know that we carried the line whose advertisement they had just read in the magazine or newspaper.

"We are constantly trying to better our service and are working out new ideas. We have successfully carried out some of my pet theories, but we are ever anxious to develop others. I am happy that I am selling service. My customers are better satisfied. And

I am happy that I have proved that dreams sometimes have a cash value.

"Nearly every great project or invention was at one time a dream, but there is one thing that we have to be careful of—dreaming without action. A theory remains a theory if it is not carried out. After we have worked out an idea to the point that it seems logically correct, we put it into practice. Then, if it is correct, we reap the benefits. If it has weak spots, we can quickly see them and correct them.

"Sometimes our ideas do not work out as well as we expected, but they always show us where we were wrong and suggest the way to accomplish what we went after. Yes, we are still dreaming and we are making our dreams pay dividends."

At this point I interrupted him. "How is it, Mr. Williams," I asked, "that you selected the automotive field after having spent so many years in the department store?"

"There are two reasons why I picked this line," he answered. "The first is that I have always considered that there was a big future in the business if one went after it with a little pep. The second is that I knew that if my ideas on service were correct, they were applicable to one business as well as to another—and I wanted to prove that.

"And the volume of my business today has shown me that *service* is the basis of success in any industry. I firmly believe that any automotive dealer can cash in on those intangible things called *service and ideas*, if he has the courage of his convictions to carry them through."

Historical Origin of Names of Automobile Bodies.

The five best known and most popular styles and types of automobile bodies in the United States are the coupe, the sedan, the limousine, the touring car, and the roadster. The first three names are French in their origin and the last two are English.

The word "coupe" is derived from the French word meaning "to cut" and is so called because it gives the appearance of a larger carriage cut in half. Originally it was applied to a four-wheeled closed vehicle for two persons inside with an outside seat for the driver.

The word "sedan" was used for the first time in France, and takes its origin from the French city of that name. This name takes on a greater significance when it is remembered that the sensational advance of Pershing's riders reached Sedan when the armistice was signed. The first

sedans were portable enclosed chairs carried on poles by two men. The modern sedan has an enclosed body and accommodates seven passengers.

The name "limousine" was applied to a cloak worn in France, and probably originated from Limousin, the name of an old province in central France. Today it is applied to the chauffeur-driven car with an enclosed compartment which also contains the driver's seat.

"Roadster" was applied to vessels that worked their way by means of the tides. Later it was used for bicycles. The modern roadster has an open body, and is designed primarily for two persons, but of recent years the four-door roadster has met with popular favor.

The most familiar type, the touring car, takes its name from the fact that it is used by motorists on lengthy tours. It is an open car with a tonneau and four doors, seating, four, five or seven passengers.

Automobiles Scarce in England—American Cars in Demand.

Automobiles in England are said to be as scarce as gold mines. Cars of every description and age are being sold at prices which would have seemed impossible a few years ago. This demand for motor cars is likely to keep on for quite a while because no great number of American cars will be shipped for the reason that the demand in this country is so far ahead of the output.

Ford cars are selling for more than \$1,000 in London, notwithstanding that they are not new cars. Other American cars of the moderate prices are having 20 bidders for each car available.

High prices are also being paid for British, French, and Belgian-made cars. The latter are mostly of 1913 and 1914 construction. The majority of cars sold are used cars and in many instances are preferred to the new ones.

Motor Vehicles Show an Increase of One Million a Year.

Registration of motor vehicles in the United States has increased at a rate of more than 1,000,000 a year for the past five years.

Three and one-half times as many cars and trucks were registered in 1918 as in 1914.

The official figures follow:

| | |
|-----------|-----------|
| 1914..... | 1,711,339 |
| 1915..... | 2,445,664 |
| 1916..... | 3,512,996 |
| 1917..... | 4,983,340 |
| 1918..... | 6,146,617 |

Records Simplify Tire Adjustments

Stock Sheet Used by Salt Lake City Concern Shows Serial Number, Date Received, Date Sold and to Whom — Speedometer Readings and Other Data Taken When Tire Is Brought Back for Repairs of any Description

By Robert J. Burdette, Jr.

"What method have you devised for keeping your stock of repair parts and accessories?" was the question asked the office manager of the Guarantee Tire & Rubber Co., of Salt Lake City, Utah. The proprietor is J. L. Ellerbeck, and the plant is located at 451 South Main street, in the enterprising city of the intermountain region. The establishment is not housed in a large structure, but everything is compact as a battleship going into action.

The office manager is a business woman of ability whose creed for business commences and ends with the word "System." No catch-as-catch-

can method, but a regular half Nelson on the day's work is the day's orders in this enterprising shop.

"Well, here's a case at point which

accessories. "I have a regular doom's day book of a record sheet here which has been the firm's silent partner for these four years. A man just brought in a punctured tire which was also in pretty bad shape. And I might have been persuaded to have replaced it with a new one— if unconscious—and if it had not been for this same old record book. But I turned to that volume and read the lesson of the day to the man.

"Now, we deal in tires, batteries

and spark plugs. We keep records of the former two, but the latter are numerous as cooties on a veteran so

(Concluded on page 44.)



Interior of Salesroom of The Guarantee Tire & Rubber Co.—System and Order Prevail.

| GUARANTEE TIRE & OIL CO. | | | | | | | | | | | | | |
|--|----------------------|------------|------|-----------------------------|---|--------------|-----------|---------|---------------|----------|------|-------|-----------------|
| STOCK SHEET | | | | | | | | | | | | | |
| SIZE 32 X 4 | | | | STYLE <i>SL. N. Norwalk</i> | | | | | | | | | |
| CHARLES B. HADLEY CO. MANUFACTURERS, LOS ANGELES | | | | | | | | | | | | | |
| Number | DATE REC'D | SERIAL NO. | 1917 | CAR | CUSTOMER | SPEED PUT ON | MILES RUN | REMARKS | RET'D TO FACT | FAC. C/M | DATE | PRICE | REPLACED BY NO. |
| 1 | <i>From Jan 5/17</i> | 46668 | 6/13 | B | Utah Junk Co. | | | | | | | | |
| 2 | | 46698 | 5/18 | | Street Dept. | | | | | | | | |
| 3 | | 46699 | 5/7 | | Street Dept. | | | | | | | | |
| 4 | | 46657 | - | | Utah Junk Co. | | | | | | | | |
| 5 | | 46661 | 6/25 | | State Board of Education | | | | | | | | |
| 6 | | 46673 | 7/20 | | Cash | | | | | | | | |
| 7 | | 43345 | 5/22 | | W. H. King | | | | | | | | |
| 8 | | 49262 | 7/25 | | W. C. Oresh (Ret.) | | | | | | | | |
| 9 | | 49566 | 5/18 | | Street Department | | | | | | | | |
| 10 | | 49261 | 6/8 | | Andrew & Sons, Butte, Idaho. | | | | | | | | |
| 11 | | 49423 | 6/15 | | James A. Knight, Kamas, Utah | | | | | | | | |
| 12 | | 49565 | 6/29 | | City Street Department | | | | | | | | |
| 13 | | 49569 | 6/15 | | James A. Knight, Kamas, Utah | | | | | | | | |
| 14 | | 49264 | 6/27 | | Utah Idaho Motor Co. <i>was in to fix puncture. 1/15 & had been run flat was in bad shape</i> | | | | | | | | |
| 15 | | 44520 | 7/2 | | E. T. Brooke | | | | | | | | |
| 16 | | 44876 | 7/29 | | Cash | | | | | | | | |
| 17 | | 46695 | 7/29 | | E. T. Brooke | | | | | | | | |
| 18 | | 46665 | 7/28 | | Salt Lake City Street Department | | | | | | | | |
| 19 | | | | | | | | | | | | | |

Sample Stock Sheet—On It a Record Is Made of the Style and Make of Tire and the Date of Each Tire Sale, Repair or Adjustment.

Method of Cutting Threads on Lathe

To Know the Different Styles of Threads and How to Cut Them on a Lathe Will Enable the Owner of a Repair Shop to Save a Considerable Sum of Money Which Otherwise Would Have to Be Invested in Taps and Dies

By J. N. Bagley

If we were to equip a shop with all the taps and dies necessary to cut the different sizes and kinds of threads that can be cut on the lathe, we would have many times its price invested in taps and dies. Even then, we still

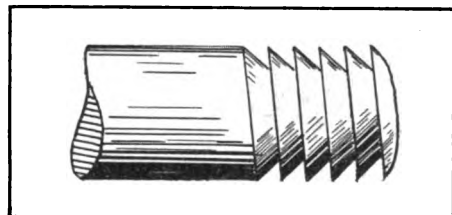


Fig. 1. Ratchet Thread.

would find many threads that we could not cut.

The modern lathe, though small it may be, should be in every repair shop in the country, for it has a wide range of uses, and will pay for itself in many ways in a very short time. The lathe can be used for the regular turning and boring, with which most of us are familiar. For fitting small bushings and pins, it has no equal, but at this time we will discuss only the threads and thread-cutting.

The first thing we must know before attempting to start cutting threads, is the number of threads we want to the inch. To find the number of threads to the inch, a screw-pitch gage can be used, or the threads can be counted. Then change the gears so that the carriage carrying the cutting tool will travel at just the correct speed in proportion to the speed of the driven shaft to be threaded. All lathes have small plates or indexes attached, which give the gear

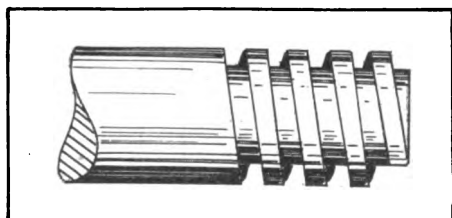


Fig. 2. Square Thread.

numbers for any number of threads to the inch, and this makes it very easy to compound the gears.

Threads are used either for holding or securing a part or parts together, or to transmit power. Therefore, the use of the thread must be considered

unless its purpose has already been determined, and it is a matter of duplicating for replacement.

There are a number of threads of different styles as will be seen by referring to the illustrations.

In Fig. 1 is shown what is termed a "ratchet" thread. The "ratchet" thread has sides at right angles to the axis of the bolt, and therefore the strain comes in direct line with the axis. This style of thread, however, is very seldom used.

A "square" or, as some prefer to call it, the box thread is illustrated in Fig. 2. This style of thread is used for transmitting power where strength is required such as in vises, lifting devices, clamps, etc.

A thread of the V-type with a double lead, is shown in Fig. 3. The true pitch of this double thread is just twice that of the apparent pitch. The distance the nut travels or advances in one complete revolution of the bolt

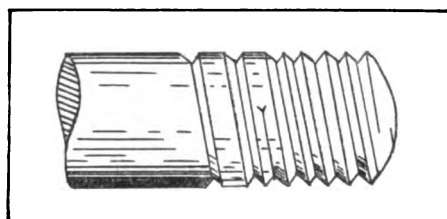


Fig. 3. V-type, Double Lead Thread.

is known as the lead. This same style of thread can be cut with a triple or quadruple thread. This has the advantage of faster motion without using a coarser thread, for the increased depth of a coarser thread tends to weaken the bolt.

The illustration in Fig. 4 shows a shaft with one end threaded with a right-hand lead and the other with a left-hand lead. If we place a nut on each end and hold them stationary and revolve the shaft, the nuts will travel toward or away from each other, depending on whether we turn the shaft counter-clock-wise or clock-wise. This type of thread is used for clamps, turnbuckles, etc.

The manner of obtaining the pitch of a thread is shown in Fig. 5. One inch on the bolt, as indicated by the dotted line, would be termed a pitch of 4 (4 threads to the inch) or $\frac{1}{4}$ -inch pitch. The number of threads to the inch in length does not, how-

ever, govern the true pitch of the thread, unless it is a "single" thread. We refer to a "single thread," when the thread makes one revolution to the true pitch.

Now that we have touched in a general way on the threads in use, the

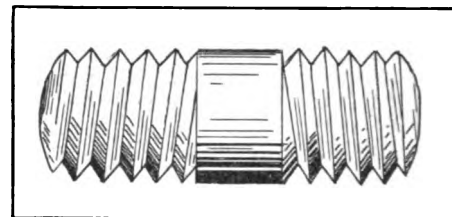


Fig. 4. Right and Left Hand Leads.

method of cutting these threads on the lathe will be taken up and, if possible, each step made clear to the beginner.

The first step in cutting threads is to find the center at each end of the shaft to be threaded and mark it with a prick-punch. Then drill a small hole, *B*, in each end, as shown in Fig. 6-B, somewhat deeper than the center will reach. Next in order will be the counter-sinking at *C*, so that center *D* will have a substantial bearing surface. The drilling and counter-sinking can be performed in one operation with a center drill.

After fitting the two ends in this manner, place a drop of oil in the hole of the live-center (tail-stock) and slip on a lathe-dog *E*, making it secure with the set screw *F* and place it between lathe centers as shown in Fig. 6-A. Allow the "dog" to lock into

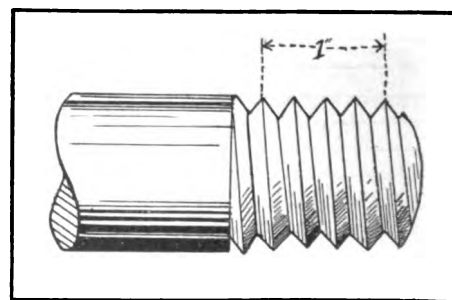


Fig. 5. Manner of Obtaining Pitch.

one of the slots in the face plate which drives the shaft while the cutting and threading is being done.

After the shaft is placed between the centers it should be adjusted until no slack is noticeable. It is then

ready to be turned to the required size. After the shaft is turned to size, the next step consists in preparing the threading tool and cutting the thread.

Grind the tool to shape, which

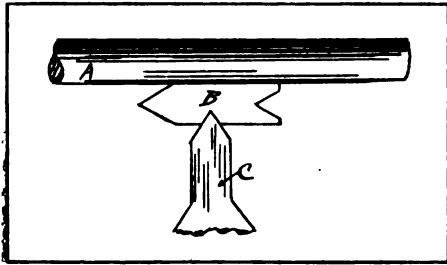


Fig. 7. Correct Way of Setting Tool.

should be 60 degrees between cutting edges, and place it in the tool-holder, leaving it just loose enough so that it can be adjusted with a slight tap.

In Fig. 7 notice how the threading tool is fitted into the notch in the gage, *B*, which bears against the shaft, *A*, to be threaded. When the correct position has been found, the tool should be tightened so that it cannot move from its setting.

Now move the carriage carrying the cutting tool to the extreme end of the shaft next to the tail-stock—providing the thread to be cut is right-hand—and set the cutting tool just deep enough for the first cut. Turn the lever on the apron which engages the carriage so that it will travel as the shaft is revolved and begin cutting the thread.

Run the lathe until the desired length has been cut on the shaft, then reverse the direction of the spindle and at the same time move the tool back from the work. Continue the

travel of the carriage backward until the starting position is reached. Reverse the direction of the spindle and make a second cut. Continue in this way with a small, even cut until the thread has been cut to the required depth.

Should it become necessary to remove the tool for grinding, care must be taken to replace it in exactly the same position as before, or the thread will be cut from one side and ruined.

If at any time it is necessary to remove the work from the lathe, the tail-stock may be loosened and the shaft, with the lathe-dog attached, may be removed. Care should be taken to replace the "dog" in the same slot in the face plate as before, when replacing it for additional cutting.

In some cases where the work is short and stout, it may be held in the

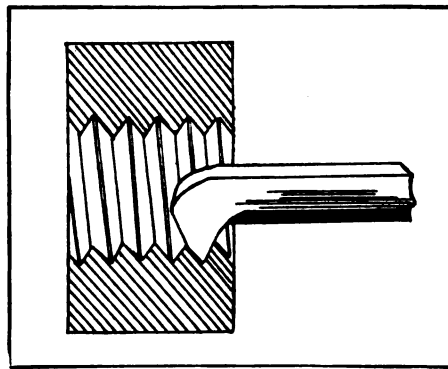


Fig. 10. Inside Threading—Finishing Cut.

chuck without the use of the tail-stock center but care must be exercised so that the tool is correctly set, or it will run under the work and spring the lathe spindle or break the cutting tool.

Therefore, it is safer for the beginner to use the tail-stock center on all work.

The position of the cutting tool making the first cut is shown in Fig. 8. Starting at *A*, the tool is carried

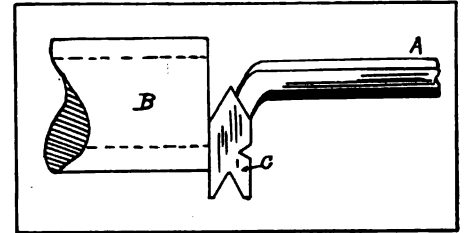


Fig. 9. Setting Tool for Inside Threading.

along as the shaft is revolved until it reaches the desired point *B*, when the cutting tool is backed off and the direction of the lathe spindle reversed until the tool has returned to position *A*. For each new cut the tool is set deeper until the required depth has been reached.

Inside threading is very similar to outside threading. Referring to Fig. 9, *B* represents the piece to be threaded and the dotted lines the inside diameter. The first thing to do is to set the cutting or threading tool in the correct position. To do this use the gage, *C*, as shown. As soon as the correct position of the cutting tool, *A*, is found, tighten it in the tool-holder sufficiently to prevent it from backing away from the work as it is forced in for the cut. A view of the finished job is shown in Fig. 10.

The cutting tool for inside threading should be heavy enough so that it will not spring away from the work or chatter and leave a rough-surface thread.

The possibilities of the lathe as a threading machine are limited only by the ability of the operator, and experience which results in perfection.

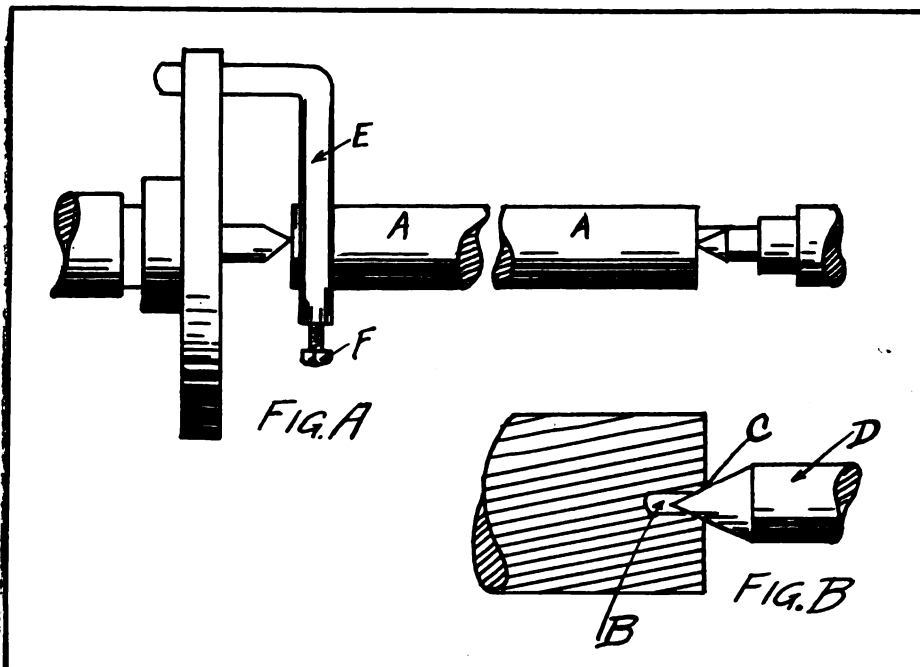


Fig. 6. (A) Proper Way of Fastening Work-Piece in Lathe. (B) Proper Depth of Center and Countersink for Lathe Centers.

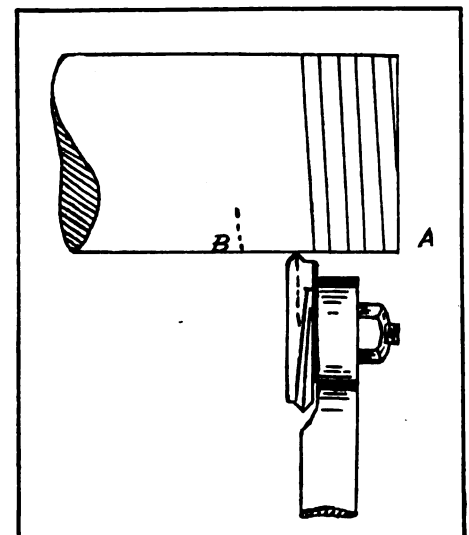


Fig. 6. Making the First Cut With the Threading Tool.

The Law on Disobeying Shop Rules

Have You Formulated a Set of Rules for Your Garage or Repair Shop, Posted Them and Let Them Go at That?—Courts Have Granted Compensation to Persons Injured as a Result of Disobeying Rules Under Certain Conditions

By Chesla C. Sherlock

Everyone in the Sanderson garage liked Harry Ford. He was young, handsome, full of "pep," and he had a winning way about him. But there was just one fault with Harry, and it was a bad one. He was headstrong; didn't like to do things the way his boss told him to do them. He was a keen student of machinery, generally saw the remedy in a minute and wanted to do the thing "his own way."

All of which wasn't much of a fault when you stop to think that most employers allow shopmen to follow their own inclinations as far as possible. All that is necessary is to get the work well done, and in a hurry.

Usually, where there are men working around dangerous machinery, the employers formulate a set of rules designed to show the men the best method of conduct around such machines. The rules are not given in a spirit of authority; they are given in a spirit of protection to the workmen.

A set of such rules were formulated and posted in the shop, where they were read and soon forgotten by the men. Soon they were covered with dust and dirt and became scarcely readable to the passerby.

Now these rules apparently did not amount to a snap of a finger to Harry Ford, or any of the other workmen in the Sanderson garage. They went about their daily work as if there wasn't such a thing in existence.

But one day they came to light in sudden fashion when both Harry Ford and Jim Drake were injured. They had a "forked tongue," as the Indians used to say.

Jim had been trying to repair a broken fan on a high-powered motor. He violated one of the rules which positively forbade workmen to work in the vicinity of a motor fan when the engine was running. Sticking his hand in to edge the belt over a trifle, Jim's fingers were caught by the revolving blades and he lost two fingers, one at the middle joint and the other at the first joint.

And, almost at the same time, Harry Ford met with serious accident while sliding down the elevator cable to the first floor. You may won-

der what on earth he was doing on that cable. So did his boss, the court, and the compensation commissioner at the State House.

But he was on the cable, and furthermore, it developed that Harry had been in the habit of getting downstairs in just this fashion for several months. The elevator usually rested on the basement floor, and Harry thought it was a great time-saver to slide down rather than to bring it up or down the stairs. On one occasion the boss had caught him at it and expressly forbidden him to do it again.

"For your own good," he had added, "and, besides, it's contrary to rules."

Harry, being young and strong and full of life, had merely laughed aside the boss's warning.

But in the view of the following events, it is necessary to add that the boss did not know that Harry was still disobeying the rules.

When both of the boys were injured, the boss notified the insurance company in which he carried his policy, and in the course of time, the claims were refused by that company on the ground that it was not liable.

The two cases were appealed to the compensation commissioner of the state by both men. They felt that if there was anything to the workmen's compensation system that here was a chance for it to be proved to them. Hadn't the boss paid premiums on their risk and didn't the law say that men injured by accidents while at work were entitled to half pay during the time of their disability? Why, certainly! It was as plain as the nose on your face.

It is not necessary to tell all that took place between their appeal and the decision of the commissioner. Those who have been in a similar position know only too well what happened.

Both cases were tried the same day by the commissioner, for they involved similar points and there was no dispute as to the facts. It presented a point of law which the commissioner settled in a very short time.

He awarded compensation to Jim Drake and denied it to Harry Ford! Both were astonished. They had thought that if one lost, both would

lose, as it had been so stated to them by many parties.

But the compensation law is not so arbitrary as the common law. Said the commissioner: "I am awarding compensation to Jim Drake for the reason that although he violated a rule which had been formulated some time previously by his employer, he did not, by so doing, take himself outside the scope of his employment. He was still in the course of his employment, under the law, for the reason that the rules formulated and posted by his employer had never been enforced by him. They were constantly being violated, and this fact must have come to his notice and knowledge. But he did nothing to enforce them. He had, as was the case with his men, apparently forgotten them."

"However, in the case of Harry Ford, we have a very different proposition to decide. As in the previous case, there was a rule which prohibited men going down stairs or taking any unusual risk. This rule was published and posted in the same manner as was the rule which applied to Jim Drake."

"But the rule had not been forgotten by Ford's employer. Upon seeing him sliding down the cable, the employer had reminded Ford of the rule and expressly forbidden him to violate it again. He did not know, that Ford was violating it, hence he had the protection afforded by the rule which allows an employer to make reasonable and necessary rules for the protection of their employes. Violating it as he did and against the express orders of his employer, Ford took himself outside the scope of his employer, and consequently is not entitled to compensation."

Millions Spent to Replace Light Buggy Bridges.

The limiting factor in a great many roads extensively used has been the antique bridges built in the days when light buggy traffic was the rule. Gradually the state departments are overcoming this handicap to travel by replacing these structures by solid, concrete spans. In 1917, \$47,290,706 was expended in this way in the United States.



Fast Work and Courtesy Win Success

Sending Out Battery and Tire Repair Jobs When Promised Revives a Failing Establishment—Politeness From Every Employee and Series of Personal Letters to Car Owners Help Illinois Tradesman Make Profits

By James F. Hobart

A new manager took charge of a rather run-down service and repair garage at Flora, Illinois. In less than a year the establishment disposed of thousands of tires, cared for hundreds of cars, and became known for hundreds of miles in every direction as a garage where accommodations by night and by day were available.

It was the "Lincoln Trail Garage," J. M. Carney, proprietor, that progressed from a struggling little hand-to-mouth shop to occupying the entire first floor of a large brick structure. There is a very well equipped repair shop, a tire repair and vulcanizing department, commodious storage space well filled with cars of customers, also office conveniences, waiting rooms and women's retiring parlors.

During three or more years of precarious existence, this garage has been under the direction of several managers, each of whom failed to make the business a paying one. Finally, a little more than a year ago, Earl McBride was appointed manager. Under his management the business has developed to its present proportions and is constantly increasing in volume. He is a registered pharmacist, driven by failing health to abandon the drug business for one calling for greater bodily activity and less confining duties.

Mr. McBride gives personal attention to the tire department. He has gradually built up a nice business and gathered a fine collection of tools and machines for rebuilding and repairing all sizes and kinds of tires. One of the slogans used to obtain business is:

"We put more service into your old batteries and old tires."

By doing good work, and sending jobs out exactly when promised, the business in those two lines has become very large and steady. In building it up Mr. McBride made use of letters of solicitation very extensively but, to use his own words: "a letter to a man unless you know your man, is only a letter to the waste basket; why, I have letters of solicitation, circulars and similar matter coming in here by the hundreds and they usually go straight to the waste basket. Very few of them are ever read or even looked at.

"When I first became manager," Mr. McBride continued, "I tried the letter plan, but made nothing from it, not even enough to pay the postage bill. But I

felt sure that letters would bring me business if I could only send the letters to the right people. So I used to take a few days off, a week now and then, perhaps, and go to some likely town nearby and get acquainted with car owners. It is not a hard task in a small place, to locate all the automobile owners and users and to scrape a speaking acquaintance with each man.

"While I was doing that, I formed a pretty good idea of the condition of each car and entered the owner's name and the data obtained on a card which was dated and filed for future use. I did this thing whenever I could find or make opportunity and in the course of a season, I visited many of the adjoining towns. About a month after visiting a place, I would write to each automobile user on

HONOR IN BUSINESS ALWAYS AN ASSET.

To fulfill every promise; to mix integrity with every article you sell; to be courteous and kind; to be fair always to all men; to build up with hope for better things as your guiding star; to keep faith with others, as well as yourself; to try to do the thing better than it has been done; to hate sham, shoddy and bombast—of such is the kingdom of successful business.—Rotarian Service.

my list, a separate personal letter. I would bring to his mind my visit and talk with him, and offer to make any changes or repairs which I judged his car might be in need of, laying particular stress upon the repair of tires and of storage batteries.

"Those letters paid well for the trouble of writing them, and for the time and expense of visiting the localities to which the letters were sent. At the present time, I can trace back to those letters, a regular and steady custom of about \$100 a month which came directly and entirely from the letters in question. I know that the volume of this business is constantly increasing.

"Another innovation I made some time ago was fought at that time by Mr. Carney to the best of his ability. He told me that I never would make the scheme pay and that it would prove to be a never-ending source of expense to him. But I finally prevailed and now Mr. Carney is only too glad to acknowledge that the scheme has proved to be very profitable.

"The innovation was this: The garage is never closed nor left alone, day or night or Sunday. I engaged an old man who was a retired repairman to stay in the garage nights. He was not expected to do any repair or service work and he did none, save the selling of oil and gasoline and such things when required by people who drove through at night. But this man was on duty all night; kept the garage warm and extended a welcome to each and every driver who chanced to call before or after business hours.

"The services of this man were obtained for the small sum of \$1.25 per night, seven nights in the week, and drivers for miles around know that they are always sure of a welcome at the Lincoln Trail Garage, no matter when they arrive.

"Hearty and honest courtesy is one kind of service which I insist upon from every employee, from the night man up to and including myself, and to it I owe a good share of the success met with. The night man was selected principally because he possessed that characteristic. When I hire a mechanic or a salesman, I tell him very plainly that he must have a smile on his face all of the time while on duty. Better yet, while off duty, too, then he will never forget himself and leave that smile at home in his 'other clothes.'

"I drill all my men to be cheerful and to make the customer cheerful too. When a patron comes in with a grouch on, my men go to work and remove that grouch as speedily as possible, and it is a mighty bad one which will not speedily give way to the good nature of my mechanics. I tell them to get the grouchy man to talking as soon as possible, for you can do nothing with a grouch who will not talk. But, as soon as you get one to talking, even though he says only hard and bitter things, there is hope for him, for good nature is mighty catching and my men work it for all it is worth.

"It usually does not take one of them very long to get a bad case into good humor, and then everything is plain sailing and my men and customers simply radiate good nature. Things go smoothly and the patrons always come back, even though they have to drive miles out of their way to reach this garage. You see, I find that my drug store experience is very valuable to me in many ways. I have learned how to reach people and to

obtain their confidence—the good nature scheme does that—and the experience obtained in purchasing has stood me well many a time since I came here.”

Mr. Carney has now extended his business activities considerably, being associated with E. A. Medley in the firm of Medley-Carney Company, wholesale automotive sundries.

The concern has taken on a number of lines, one being a well known piston ring on which a good trade has been developed. Other lines are being added and by rendering good service to dealers the firm is now shipping to almost every town of any size in southern Illinois and western Kentucky.

The repair shop and vulcanizing department are still being operated along the

lines established by Mr. McBride. Tires are being sent to the Lincoln Trail Garage from many nearby places. One day late in August a casing was received at the Flora office from a customer in Chicago, who believes the tire repair work done in the little town in southern Illinois is worth shipping charges between there and Chicago.

Automobiles Are Supplanting Horses in New York City.

In the farming districts at the present time the preservation of the horse as a medium of travel and a source of power appears probable. It is asserted, however, that in the city the horse will soon become extinct. This process of extermination, if it may be so called, has been investigated

in New York City by the state field agent of the Department of Agriculture.

The census enumerators of 1910 found 128,224 horses in the city, including nearly 3,000 horses on farms. By the stable enumeration of the Sanitary Bureau of the Board of Health, 108,036 horses were found in 1917 and 75,740 horses in 1919.

Assuming that the enumerations of the two agencies are fairly comparable, it appears that 16 per cent. of the number of horses of 1910 had been lost by 1917 and 41 per cent. by 1919. More than 25 per cent., or one-quarter, were lost in the last two years, and only 16 per cent. in the preceding seven years. These are averages for Greater New York, and the progress of the movement has varied in the outlying districts of the city.

The Features of Farm-Electric Plants

In Design and Construction the Farm-Electric Plant Is Very Much Like the Power Plant of an Automobile—Its Repair and Maintenance Is Essentially Based on the Principles and Methods Employed in Automobile Repair Work

By E. C. Pohlmann

Take the motor and its accessories from the chassis of any automobile, place it in the basement of a farmhouse and essentially you have the farm-electric plant. It differs only in size, compactness, and control.

In the automobile power plant you have the engine with carburetor, generator and magneto, or dynamo; while the storage battery, the switches, the fuses, the voltage regulator, and measuring instruments constitute the electrical equipment. So in the farm-electric plant you have everything that the automobile power plant has, only its appearance is different, for it is designed differently.

Farm-electric plants are either belt-connected or direct-connected; the engines are single cylinder, air-cooled or water-cooled, and are either of the poppet, the vertical-sleeve, or the rotating-sleeve valve type. Most of the units are direct-connected and integral—that is, the engine, generator, fuel tank, and switchboard are assembled on the same base.

Some of the engines operate on gasoline, others start on gasoline and operate on kerosene. The dynamos are of the commutator type similar to the kind used on automobiles, and as a rule are ventilated by means of a fan which is a part of the fly-wheel.

The switchboard is fastened to the same base as the engine and generator, and essentially, it is similar to the dashboard on an automobile. It

contains switches which provide for using the dynamo either as a motor for starting the engine, or as a generator for charging the battery. Mounted on the switchboard are an ammeter and voltmeter, or a gage which indicates charge or discharge, and a voltage regulator and circuit breaker.

The storage battery is of the lead-plate type and is similar to the kind used in automobiles, except that the containers are

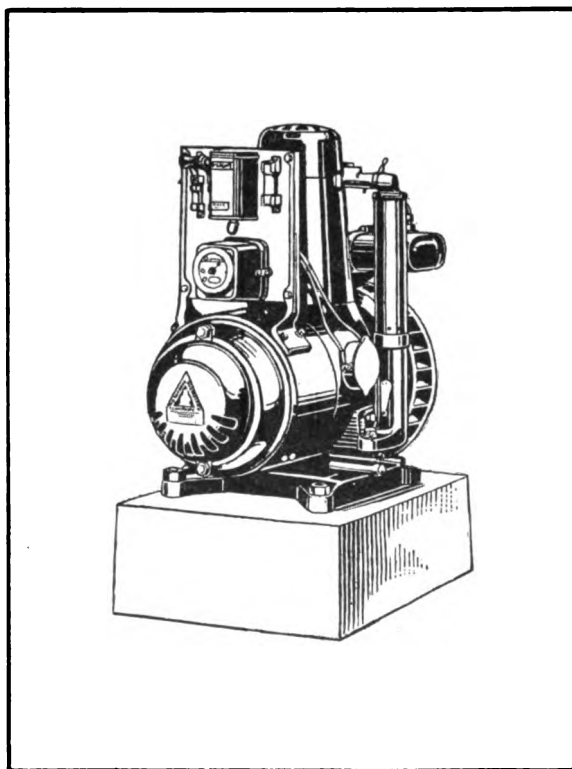
made of glass instead of hard rubber. These are mounted on wood shelves, and should be kept apart from the power plant proper.

In estimating the size of plant for a farm, it is necessary first to determine the number of lamps required in each room, together with any other electrical appliances that will be used in connection with the plant. The lamps consume either 20 or 40 watts per hour. An electric motor of one-quarter horsepower consumes about 500 watts per hour and an electric iron about 400 watts per hour.

To obtain the maximum number of watts that will be consumed on any particular day, multiply the number of lamps by the number of hours they will burn each day, by the number of watts per lamp; this will be either 20 or 40 watts, depending on the size selected.

This sum will give the lighting load per day when all of the lamps are used. When deciding on the size of the power plant select one which has a battery capacity to furnish this number of watt hours per day for five or six days. Under average conditions, however, the lighting load will be much less, so that the battery will have to be charged only every seven or eight days.

To more fully explain the method of estimating the size of power plant required, each room, with the estimated number of lamps that would be used and the number of probable hours the lamps would burn each



Typical Design of Farm-Electric Plants.

day, is tabulated below, and from the data the lighting load per day in watt hours is calculated.

| | |
|---|-----------------|
| Parlor, 2 40-watt lamps three hours a day..... | 240 W-H. |
| Dining room, 2 20-watt lamps two hours a day..... | 80 W-H. |
| Kitchen, 1 20-watt lamp four hours a day..... | 80 W-H. |
| Bedrooms, 3 20-watt lamps one hour a day..... | 60 W-H. |
| Hall, 1 20-watt lamp two hours a day..... | 40 W-H. |
| Porch, 1 20-watt lamp two hours a day..... | 40 W-H. |
| Basement, 1 20-watt lamp one hour a day..... | 20 W-H. |
| Barn, 3 20-watt lamps two hours a day..... | 120 W-H. |
| Total | 680 W-H. |

These figures are for a maximum lighting load. Selecting the average farm power plant on the market, which is at about 3,000 watt-hours capacity, means that the battery will have to be charged approximately every four days. This is for maximum conditions, that is, when all lights are burned each day. As stated before, under average conditions the battery will have to be charged only about every seven or eight days. When the electric iron or an electric motor is used, it is best to take the power directly from the generator.

In selecting the location for the plant, choose a place which is accessible, has plenty of ventilation, and where water will not freeze in winter. If possible, locate it near a window in either the cellar, milkhouse, or garage. The air-cooled engines give up considerable heat and consequently a place must be selected which has sufficient ventilation to keep the room at a reasonable temperature.

The place must also be warm enough in winter so that water will not freeze, because the battery operates with better efficiency at temperatures around 50°, and when partly discharged is liable to freeze. Furthermore, if the engine is water-cooled, it must be protected from freezing.

If the battery is located in a place where the temperature is liable to fall below the freezing point, it is best to keep the battery well charged to prevent the solution from freezing. The following table gives

the different specific gravities of the solution corresponding to the temperatures at which freezing occurs:

| Specific Gravity of Solution by Hydrometer. | Freezing Point by Thermometer. |
|---|--------------------------------|
| 1.100..... | 18 dgs. F. |
| 1.150..... | 5 dgs. F. |
| 1.175..... | -5 dgs. F. |
| 1.200..... | -15 dgs. F. |
| 1.225..... | -35 dgs. F. |
| 1.250..... | -50 dgs. F. |

It is best to place the battery in such a position that the heat from the engine will not strike it and that the cells are accessible for inspection and repairs. The battery, as previously stated, should be set on strong wood shelves and the cells spaced so that each one can be inspected and repaired without disturbing the rest.

All of the engines start on gasoline, and

are cranked by hand or by using the dynamo; some of them operate on kerosene after they are warmed up. After the dynamo is used for starting the engine, care should be taken to see that the proper connections are made on the switchboard so that the dynamo will charge the battery.

After the engine is started, no further attention is needed except to see that there is enough fuel in the tank for eight hours' operation. When the battery becomes charged, the circuit breaker shuts off the engine and breaks or opens the circuit from the generator to the battery so that no counter flow of current can take place.

The engine should receive the same attention that the automobile engine gets. The sparkplugs should be cleaned occasionally, the oil renewed periodically, and the crankcase removed once a year and thoroughly cleaned with kerosene. If the motor is water-cooled, clean the system about every three months with hot water in which washing soda has been dissolved. Heavy cylinder oil should be used for lubricating the engine.

The generator needs very little attention. See that the bearings are properly lubricated with a light dynamo-bearing oil, which is best for this purpose. The commutator should be cleaned occasionally with sandpaper, and the brushes examined to see that they bear properly on the commutator. Cylinder oil is an insulator and therefore must not be allowed to get into any of the electrical connections such as brush holders, brush-holder cable connections, or on the commutator.

The brushes should bear evenly, but lightly, on the commutator. When there is a slight sparking at the brushes which cannot be remedied by shifting them forward or backward, a very small quantity of some good commutator oil may be applied with a rag, otherwise keep the commutator clean by wiping it with a cloth moistened with kerosene.

If the sparking is due to an imperfect seating, the brushes should be carefully sandpapered. Take a strip of sandpaper No. "00" (never use emery cloth, because emery is a conductor and will cause a short-circuit), lift the brush and place the paper under it with the smooth side next to the commutator. Then, after letting the brush down and holding the paper snugly against the

PREPARE FOR THE NEW FIELD!

On these pages are presented the essential features of construction and operation of farm-electric plants; they are thoroughly explained in as non-technical language as possible in order to acquaint the automotive dealer, the garage owner, and the repairman with this new machine which is bound to produce as many sales as the automobile and more than the tractor, and finally result in a demand for service and an increase in the sales of accessories.

With increased demands for farm-electric plants will come a new opportunity in business; and the logical man to take advantage of this opportunity is the garageman. Prof. Scoates of the Agricultural and Mechanical College of Texas, writing to the editor says: "I think you are right in this proposition and I feel sure that there is an opportunity for development along that line."

Essentially, the farm-electric plant is like the power plant of an automobile; in design it is very similar, and fundamentally it is based on the same principles. Who knows the automobile better than the garageman? This is your field, and the sale and repair of farm electric plants is your work!

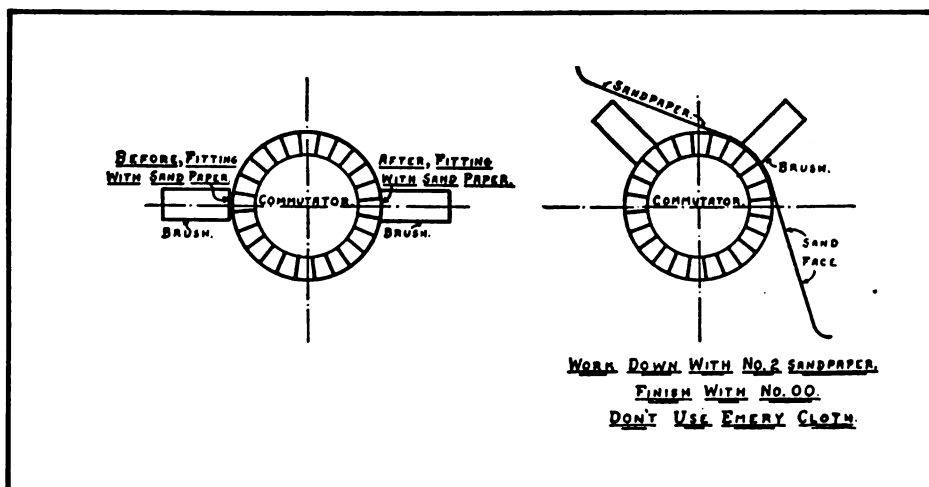


Illustration of Method Used in Fitting New Commutator Brushes by Working Down With Sandpaper—Same Method Can be Used for Trimming Brushes In Use.

commutator, carefully draw the sandpaper in the direction in which the commutator rotates when in operation. Repeat until the brush fits perfectly.

The same method is used when installing new brushes which come square and have to be shaped to the commutator; in this case, however, work down with No. 2 sandpaper and finish with No. "00."

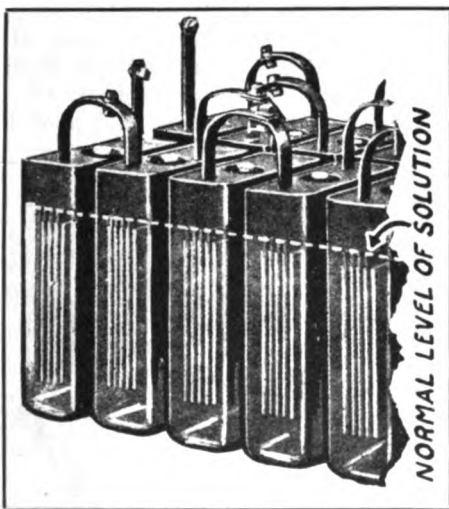
The storage battery is the most essential part of the farm-electric plant, and as such should receive special attention. Normally the specific gravity of the solution, or, as it is called, the electrolyte, in each cell should read from 1.25 to 1.27 when fully charged, and should never discharge below 1.18.

It is a simple matter to determine the specific gravity of the battery. A hydrometer syringe is inserted into the cell, and the bulb pressed to draw a sample of the solution into the syringe. The intersection of the level of the liquid with the graduations on the hydrometer gives the specific gravity.

Distilled water should be used to replenish that which has evaporated and the level in each cell, at all times, should be kept at least one-half inch above the plates, as shown in the illustration. If any sediment gets into the jars, charge the battery before removing the solution for the purpose of cleaning.

The water should always be added before charging. Rainwater, if it is clean, can be used instead of distilled water. It is never necessary to add any acid, for the acid in the solution does not evaporate. If it is necessary to add acid because of a spill, it can be made up as follows:

Take a glass or earthenware vessel and fill it half full of distilled water, then *slowly* add commercially pure sulphuric acid, specific gravity of about 1.80 to 1.840.

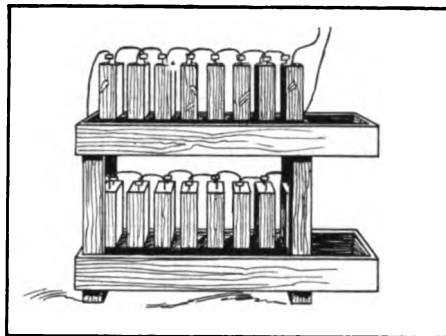


Level Should Be One-half Inch Above Plates.

Stir the acid in the water slowly with a wooden stick. Continue to add the acid *slowly* until the specific gravity of the solution reaches about 1.25 as shown on the hydrometer. It will take about one-third

as much acid as water. The hydrometer should be used frequently while mixing the solution, and the final reading should be taken after the solution has cooled down.

In mixing the solution, extreme care



Arrangement of Battery on Wood Shelves.

should be exercised and the acid poured into the water—never do the reverse. Do not stand with the face over the jar, but to one side.

Once each month the battery should be given an overcharge of about three hours. This helps to keep the plates in good condition. It should be done at the close of a regular charge, and after the engine has been stopped by the circuit breaker, by throwing a switch into the position marked overcharge and starting up in the usual manner. This overcharge has to be watched because the regulator will not stop the motor.

The electric connections on the switchboard are so arranged that power can be taken directly from the generator while charging the battery or the engine can be used independently of the generator for power purposes. After operating the engine for power purposes only, be sure to throw the switch back into the position for battery charging.

U. S. Motor Cavalcade Completes Trip Across Continent.

The journey of the Motor Transport Corps, which motorists have been following with interest, was completed a week or so ago when the cavalcade arrived in San Francisco, its objective. The corps started from Washington and followed the Lincoln Highway through most of the cities of the country traversed.

This transport was the heaviest in the history of the army as no motor transport corps ever before attempted a continuous journey of more than 3,000 miles with full war equipment.

It consisted of 72 motor vehicles, 60 of which were trucks and the remainder passenger cars. The train also carried a 3,000,000 candlepower searchlight mounted on a big truck. There were 253 men in the train's personnel.

The men selected to handle these trucks were particularly fitted for their work. The

motor train was preceded by a road-making and bridge-repairing crew, necessary because of the many bad roads and weak bridges which the trucks were bound to encounter. Everything in the way of supplies needed for the trip was carried by the train.

The object of the government in sending this train to San Francisco was the establishment of a transcontinental route for trucks and passenger cars and to show the feasibility of long truck runs.

Believes Bad Road Conditions Are About to Change.

Road conditions which have been one of the greatest drawbacks to the growth of the motor truck industry in the past are about to change. Arthur T. Murray, president of the Bethlehem Motors Corporation, Allentown, Pa., believes that, with the expenditure of a billion dollars in 1919, the motor truck will come into its own.

In the future Mr. Murray foresees loading platforms along the roadways in every direction, and farmers shipping by lines of trucks which will pick up the loads en route to business centers and on their return deliver goods desired from the city. He also believes that, with the completion of America's great road system there will be a complete change in the stockyards facilities.

"The hauling of livestock in motor trucks is one of the most practical uses of the motor-driven vehicle," said Mr. Murray recently. "Driving livestock over the roads to the market is expensive in the loss of flesh. The condition of the stock on its arrival at destination is bad.

"Transporting this stock by motor truck means the arrival at destination in much better condition, and the higher price secured means not only a profit on the truck from the time saved, but also a higher price for the stock because of its condition.

"Motor transport stock will certainly be a feature of future markets, and will command much higher prices than stock carried by railroads under hardship which causes an appreciable diminution in its value.

"The increasing use of motor trucks will bring about an improvement in stockyard conditions. In many places there are no facilities for the proper handling of the animals, and changes will be made in the construction of the loading platforms and in many other ways. The increase of motor trucks among the farmers will benefit not only the farmers, but the stockyards people as well. Every one of these features must be worked out, and standardized.

"The farm market for the motor truck manufacturer is going to be so large that it will be well worth while to carry on a campaign of education."

Practical Hints for Shop Mechanics

Conducted by E. C. Pohlmann

To Stop Ford Pumping Oil.

It is a common thing for No. 1 and 2 cylinders of a Ford engine to pump oil. To overcome this, punch a hole between No. 2 and 3 cylinders, in the brass tube which conveys the oil to the front of the motor.

This will allow a smaller quantity of oil to be delivered to the first two cylinders and eliminate the excessive pumping of oil.—H. M., Texas.

* * *

Sparkplug Cleaner.

A very simple method of cleaning the porcelain of a sparkplug to the extent that it appears like new, is to soak it in carbon disulphide.

* * *

Sheet-Metal Mallet.

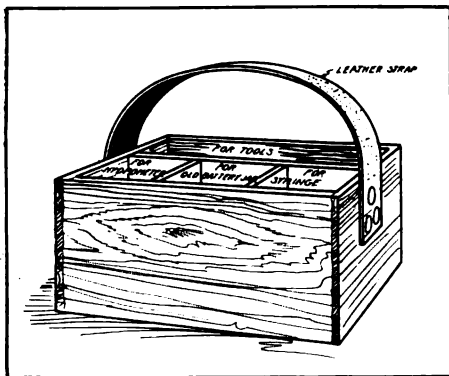
It is a well-known fact that when straightening parts of sheet metal, a hammer or metal mallet is not to be used. A heavy, tempered blow is necessary in work of this kind. That struck by a wooden mallet has the required quality, but is quite apt to mar the finish. Fastening a thick piece of leather over the head of the mallet will tend to soften the blow.

* * *

A Handy Battery Kit.

A convenient kit for tools necessary in taking hydrometer readings and replenishing the water supply of a storage battery can be constructed from a rectangular box, which should be divided into four compartments.

One compartment should run the entire



A Simple and Handy Battery Kit.

length of the box and be used for various tools—screwdriver, pliers, ammeter, etc.; the second compartment should be in one end and square in shape, to contain a hydrometer packed in a cylindrical paste-

board box; the third compartment should be in the opposite end and about the same size as the second, for holding a syringe for placing water in the battery; the fourth compartment, occupying the space between the second and third compartments,

ONE DOLLAR EACH!

Each shop hint and illustration printed in this department means one dollar or a renewal of subscription to the person sending it in. You have some time or labor saving ideas which you know are thoroughly practical. Tell us about them in your own language. Write out a brief description, with a sketch if necessary, that is all we require. We will fix up the sketch for reproduction, a finished drawing is not needed, simply a free-hand sketch. You get a dollar if the idea is worth publishing.

should contain an old battery jar filled with distilled water.

A leather strap can be used for a handle by securing its ends to the box. If such a kit is kept in readiness, the mechanic will lose no time in hunting for mislaid tools.

* * *

Using Water When Drilling.

Many mechanics are afraid to use water, especially when drilling in a lathe and when its use will be found a great advantage. Up to the point where the water becomes a nuisance to the workman, too much cannot be used, especially when drilling hard castings.

* * *

Hard-Metal Drill.

When occasion demands that a hard metal is to be drilled, the mechanic should bear in mind that the drill itself must also be very hard. He should use as much force as possible in pressing the drill against the metal, operate at a low speed, and use a great deal of oil in the course of operation. There are cases when better results will be obtained from the use of turpentine instead of oil.

In case a drill sufficiently hard for this purpose is not included in the tool equipment, it is possible to harden an ordinary drill by heating it to a dull red and then dipping it in mercury instead of in water; this will make the cooling process much

quicker. It is also well to cold-chisel a nick in the surface of the metal which is to be drilled, thereby providing an easy start for the drill.

* * *

Carburetor Kink.

A very serious problem very often presents itself in the way of extracting broken elbows from carburetors. Generally when an elbow breaks off on a carburetor, it will break so that it is impossible to extract it with a pair of pliers or a wrench.

The broken piece can easily be taken out with a rat-tail file sharpened at the end to a point having four sides. To remove the broken elbow, drive the sharpened end of the file into the center of the elbow and with a pair of pliers turn the broken piece out.—J. E. L., Ill.

* * *

Head Lamp Focusing Kink.

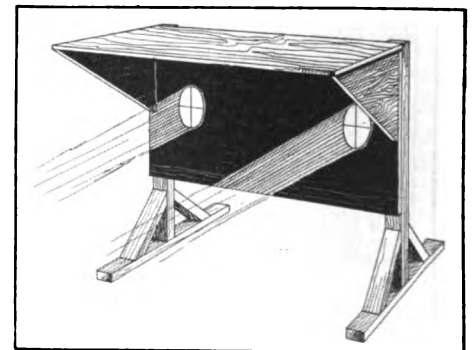
A focusing board which will be put to use many times in the average garage, can be made from an ordinary blackboard nailed to an upright support at each end, with an overhanging shelf at the top for the purpose of shading it.

The necessary crosses and circles should be made on the board so that when placed about four feet from the car, any set of head lamps can be quickly focused.

* * *

Valve-Repair Kink.

A mechanic should avoid the careless habit of throwing together poppet valves after they have been removed for regrinding. This act will not only injure the valve faces, but will cause the loss of time



Portable Board for Focusing lamps.

in locating the desired valve for assembly.

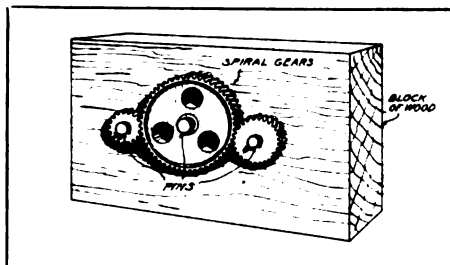
In a hardwood board about 18 ins. long, 4 ins. wide and $\frac{3}{4}$ in. thick, drill holes close to the two outer edges; into these holes the valves can be inserted in the

order in which they are removed from the engine. This device will serve as a support for the valves and will enable the workman to put his hand upon any one that is desired.

* * *

To Test Timing Gears.

Every mechanic knows that the quiet running of the timing gears depends altogether on the mesh. A jig for testing the



Test Block for Timing Gears.

gears before re-installing them in the engine can be easily made, as shown in the accompanying illustration, by using a substantial block of wood on which the gears should be mounted in the same relation as they are on the engine.

In a case where the teeth have become burred, this device is particularly useful, as such a defect can be removed by applying ground glass and oil, and rotating the gears by hand. It is essential that the pins on which the gears rotate should be hardened, also that a washer be placed under each gear for the purpose of holding it away from the plate.

* * *

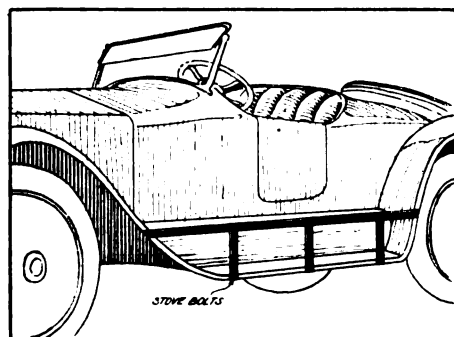
Filing in the Lathe.

In order to file work absolutely smooth in the lathe, it is best to use a smooth file that has been well rubbed with a whetstone. To polish or burnish use a little oil when filing.

* * *

A Removable Luggage Rack.

A cheap and substantial luggage rack can be constructed as shown in the illus-



A Simple Luggage Rack.

tration. It is made of round iron bars with the ends flattened out, drilled and bolted together in the form of a fence along the footboard. The ends are bolted to the fenders, and the uprights to the footboard.

A Simple Battery Tester.

A glass tube which may be carried in one of the tool-boxes makes an admirable instrument for determining the water level in the battery. Insert the glass tube in the cell and with one finger held over the end of the tube, lift it out a short distance; the depth of water in the battery will appear in the tube.

In refilling the battery with distilled water, this tube may again be used. By holding the vessel containing the distilled water against the tube, the water will flow down the tube and into the battery without a spill.

* * *

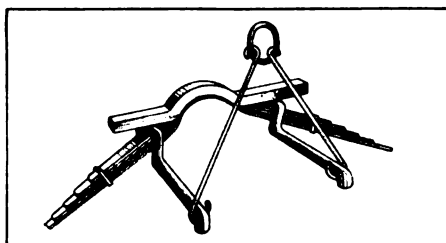
Inspection Mirror.

It is a difficult matter when adjusting differential gears to see whether the gears mesh properly. This difficulty can be overcome by mounting a small mirror on an iron-wire handle, and using it in the same manner as a dentist's mirror. This tool will be found very convenient in repairing many of the parts of a car as well as for the first mentioned use.

* * *

Raising Rear End of Ford.

A device for raising the rear end of a Ford can be made of discarded Ford rear axles. Two Ford axles, shaped as



Utilizing Rear Axles for Raising Body.

shown in the illustrations, are attached to the rear frame of the car.

Two pieces of 2½-inch round iron, one end of each shaped into a hook with the other end fastened to a ring, are hooked to these bars. The ring is attached to a chain fall and the body of the car raised.

* * *

Use for Oil Taken from Crankcases.

In the course of a year considerable oil is removed from the crankcases of motors, transmissions and differentials when making repairs or renewing the oil. Most garagemen discard this oil, thinking that its lubricating days are over.

This oil is still good, although not of the constituency necessary for efficient motor lubrication where high temperatures are employed. It can, however, be used very readily and is just as good as fresh oil for greasing plows, tools, wagon wheels and any moving parts where the rubbing speeds are very low.

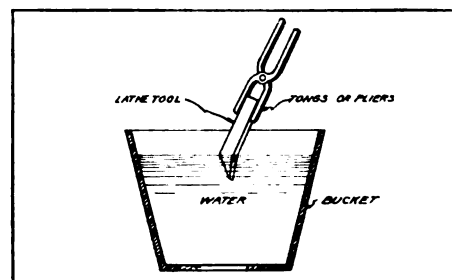
Some farmers use it to spread on the road in front of their houses to keep down the dust during the summer. Strain the oil through cheesecloth or a fine-mesh strainer

to remove foreign matter and advertise it to your farmer customers. Its low price will dispose of it very quickly.—S. O. F. III.

* * *

Tempering a Lathe Tool.

To temper a lathe tool, heat it slowly and evenly for a distance of about two inches from the cutting point. When the heated part becomes a cherry red, immerse the tool in cold water to a depth of



Proper Way of Tempering Lathe Tool.

1½ inches, as shown in the illustration.

After the point has become cool, remove the tool from the water, polish the hardened surface with emery cloth, and wipe with an oily rag. The heat in the shank of the tool will now drive the temper toward the cutting edge. When the edge becomes a brown-straw color, immerse the entire tool in cold water.

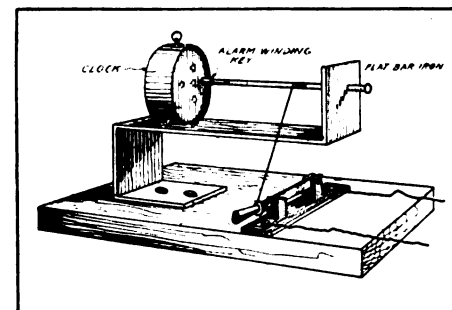
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A Clock Time-Switch.

Considerable expense can be saved in the course of a year by turning off electric signs, where permissible, at midnight instead of allowing them to burn throughout the night.

A simple device can be made which will automatically turn off the switch at a desired time. As shown by the accompanying illustration, an alarm clock is mounted on a flat board and a long rod screwed onto the shaft which winds the alarm.

It will be plainly seen that when the alarm goes off, the unwinding of the spring rotates the shaft, thereby winding up the cord which is attached to the switch



Device for Turning Out Sign Lights.

handle, and the switch is opened. When winding the alarm, wind it just enough to open the switch.

This device can be applied to other uses as well as turning off electric signs.

Welding, Cutting and Brazing Practice

Handy Devices for Use in the Welding Shop—Equipment Which May Be Made by the Welder—A Convenient and Useful Pre-heating Device—Gas Jet from a Cookstove Gas Burner—Method of Casting Aluminum Rods

By David Baxter

On the theory that anything which will save time or money for the welder, anything that will help him do better work, anything that will lighten his labor, anything that will further his physical comfort, will be of great interest to him, I will tell about a number of handy devices for use in the welding shop.

These things were chosen principally because they were home made; any little welding shop may possess them because the welder can make them with few other tools besides the welding and cutting outfit.

There is always a chance for improvement in everything, so the devices described may furnish ideas whereby a mechanic may evolve better devices, or at least something better suited to his particular shop than those discussed here.

Like nearly everything else around a welding shop these devices are made of metal, which is as it should be on account of fire risks attached to the welding business. Best of all perhaps is that the

the devices were made is to be found around nearly every welding repair shop that has been running for any length of time or may be purchased at a junk yard very cheaply.

In Fig. 1 is shown a preheating device that is convenient and useful in the extreme. This apparatus is designed for use with natural or artificial gas. It takes the gas from one line and divides it among six other lines. Which means that six different jobs may be preheated at one time, or that one large job may be heated with six burners where an immense amount of heat needs to be concentrated. Or, the burners may be arranged to heat six different parts of a large irregular job. All six burners will operate at one time with an equal pressure; or just one as desired.

The main reason for constructing a manifold of this shape was to enable the welder to get even regular pressure on all valves. This was arranged for by means of a baffle plate in the body of the manifold. The gas strikes the plate upon entering the manifold; it is then spread around the ends of this plate before it can reach the valves. The gas gathers pressure in the body of the device which equalizes no matter how many valves are opened. Had no baffle plate been inserted the gas would enter from the mainline and immediately escape through two or three of the nearest valves, as soon as they were opened, thus reducing the amount to come through the farthest valves.

The baffle plate consists of a flat piece of sheet iron cut to fit snugly through the center of the manifold pipe; it is welded in place at the corners. The plate was cut with the torch cutting-attachment. The body was made of a section of old gas pipe a yard long with ends welded in.

Six globe valves were attached to the manifold by nipples welded in holes cut or blown with the torch. A larger nipple was welded to the manifold on the opposite side of the baffle plate for the purpose of attaching the main hose. The sections of burner hose were attached to the valves by special nipples made of small pipe. These sections of hose may be varied in length to suit individual ideas.

The burners which are used with this manifold are also home-made, being constructed of pieces of old boiler flue with a smaller pipe for attaching the hose welded through a hole in and near the end of the flue. This style burner permits a large amount of air to enter the back

of the flame, which gives a larger, hotter fire.

The manifold just described is shown resting upon two other handy devices for use in the welding shop. They are a pair



Fig. 2—A Portable Preheater.

of metal "horses" or trestles. Both were made of pieces of discarded boiler flues, securely welded and filleted with Norway iron. The size and the construction are so clearly indicated in the picture that a detailed description is scarcely necessary.

A couple of handy devices that will not be out of place in any repair shop engaging in welding are shown in Fig. 2. They have many features which recommend them to the wide-awake welder. Both were made of junk material so that the cost was a small item. Each is so simple that any welder should be able to duplicate it.

By referring to Fig. 2 we observe that the young man is leaning on an odd-looking device. This is a home-made gas jet or burner of real ability. Which means that the flame or heat can be regulated precisely as needed or desired within its range. The size and shape of it makes this little burner very convenient for preheating small jobs or for localizing the heat on larger ones.

It consists merely of an old cook stove gas burner welded to a short section of gas pipe. The gas is furnished to the burner after the manner described for the manifold burner. This little preheater may be taken to almost any part of the shop or job, as it is attached to a long section of hose. The illustration should furnish a clear enough idea for any one who wants to make a burner of this kind.

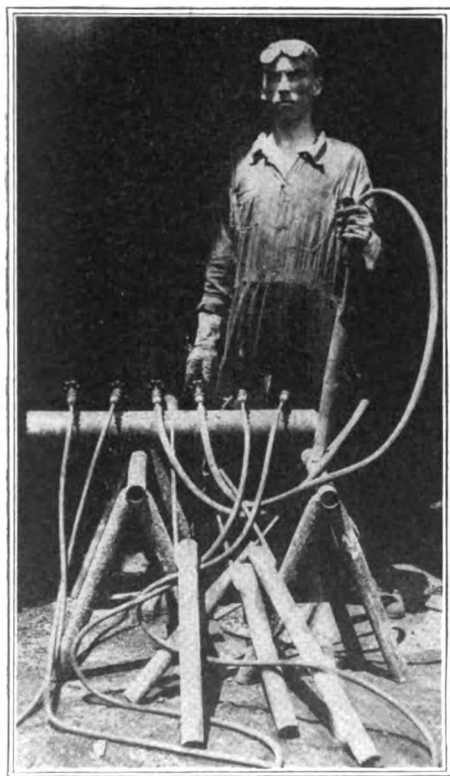


Fig. 1—Gas Spreader for Preheating.

devices shown in the accompanying illustrations were made of odds and ends of junk metal, so there was little expense as far as purchasing new material was concerned. Most of the metal from which

The other device which is shown at the other end of the welding table is a compact portable preheating oven. This was designed for use in heating all kinds of small jobs. While it may be employed to prevent the cracking of jobs caused by expansion and contraction, the main purpose was to save welding gases and welders' time.

It is probably a well-known fact that a job which is red hot will weld faster and easier than a cold one and save time and gas. It was to take care of the innumerable small broken castings that come to the repair welder that this oven was built. With it he can heat six or seven small castings at the same time with the same fire. Then weld them one at a time either in the oven or by taking them out.

The arched cover is not fastened to the oven, but may be entirely removed or merely leaned back in order to permit the welder to work on a job without removing it from the oven.

This device will save time in another way: Several small articles are piled in it to heat while the torch operator works at something else; no time lost waiting for one job after another to get hot.

The construction of the oven is shown quite clearly in the picture, and since the measurements are immaterial, as they may be varied to suit the maker, a brief description should suffice to enable any welder to build a similar device. First, the cover is made of scrap sheet metal bent to form an arch, and having one end closed by a piece of sheet metal welded in place. All of the work was done with the cutting and welding torch.

One variation of this cover might be to line it with asbestos paper, thus preventing radiation and making the thing more comfortable to work by. This asbestos could be fastened with strips of flat iron or with washers just as desired.

On top of the cover will be seen a small bracket arrangement to be used in handling the cover or as a rest for heating a bucket of water.

Next, the framework of the oven is constructed of bits of angle iron welded together. Suspended from the frame is a pan for holding the gas burner, or wherein a charcoal fire may be kindled. Leaning against the frame is the grating. This is of simple design, being merely an iron rod bent back and forth that it may rest on the shelves formed by the angle of the frame.

This type of grating possesses certain advantages; it may be removed in one movement; it cannot slip or fall out; it is easily and cheaply replaced in the event of it becoming burned or warped. This grating may also be changed to suit the individual mechanic. The whole preheater may be moved to any part of the plant or taken out on a job if desired, the open end offering an opportunity to withdraw numerous jobs without disturbing the arched cover.

Many faults have been found with home-made filler rods of aluminum. So much, in fact, that many welders have discarded their use entirely and have given up trying to make any. They were usually badly oxidized or filled with dirt or the zinc was burned out of them.

Sometimes the mold in which they were cast caused a poor quality rod; either it came out porous or filled with bits of sand. Of course a great deal of this was the fault of the one who tried to make the rods. Either he didn't use sufficient care or else he was totally ignorant of the characteristics of this peculiar metal.

Aluminum rods may be made just as satisfactorily in the welding shop as in the foundry if the welder knows what he is doing, but he should have equipment like the foundryman; this goes without saying. It forms the one main reason for so much poor success, perhaps. The average welder is not equipped to make welding rods and



Fig. 3—Casting Aluminum Filler Rods.

it is doubtful if he would want to bother with it if he was equipped. It requires too much study.

There is a method of casting aluminum rods, however, that eliminates all of the scientific part of the work. It is simplicity itself and may be done by anyone with a little mechanical skill. The directions are few, the advantages many.

Fig. 3 illustrates two ways of casting aluminum filler rods, one of which consists of pouring the melted metal in a special kind of mold. This mold is shown on the right side of the table next to the man. This mold is constructed of three (or more) pieces of angle iron welded together to form three V-grooves about thirty inches long. The melted aluminum is poured along these grooves the desired thickness, which is regulated by the fluidity of the metal and the speed with which the pouring is done.

The melting of the metal and the pouring of it are the main features of casting rods by this method. To melt the metal,

first break it into small bits and pack it in a common babbitt ladle. Old, discarded crankcases or other useless automobile castings of aluminum make a satisfactory rod for nearly all kinds of repair welding.

After packing the ladle, place it over a gas burner or on a forge fire and heat it very slowly at first. Keep increasing the heat until the ladle is red hot all over; have it covered for quicker results. If a forge fire is employed great care must be taken to not burn the bottom out of the ladle. Watch it carefully because aluminum will often remain in cheesy chunks several minutes after it starts to melt, during which time the novice may be inclined to get impatient. While the metal is in the cheesy state it may be easily crumbled with a poker.

When at the right stage it will suddenly settle to the bottom of the ladle in a silvery pool. Now shake the ladle and if the metal is thin and flat on the surface it is ready to pour immediately. Do not raise the temperature because then it is liable to turn to dross on the surface, which will gradually affect the whole mass. If some dross does appear, skim it off before pouring. Follow the above instructions carefully and do not get impatient; temper the process with a little judgment and success will undoubtedly crown your efforts.

To pour the metal, start at the opposite end of the mold from where it would seem you should start. That is to say, pour the metal backwards. In other words, do not try to pour it at one end of the groove with the idea of having it run to the other end. Reverse this proceeding by starting at one end and pulling the ladle back to the other as fast as the melted aluminum runs out of it. In effect, the stream is pulled along the groove.

A great deal of the success of this method depends upon the skill with which the metal is poured, but all it takes is a little practice to become an expert at the pouring. Of course the mechanic must also learn to judge and regulate the fluidity of his metal; get it neither too hot nor too cold; practice until the happy medium is located.

The other method is almost identical with the one just described, the only difference being that the metal is poured upon the bare surface of an iron leveling table; no grooves are needed. The pouring must be done in the same way as for the groove mold, viz., the ladle is drawn back across the table away from the stream flowing out of it. But the pouring must be quickly and deftly done for best results.

Now this pouring may look almost impossible to the uninitiated, but it is in reality very simple. The molten aluminum strikes the cold metal of the table and is almost immediately congealed, providing it is at the right temperature. So rapidly does it harden, in fact, that the novice

may be hard pressed to pull the ladle back fast enough. He may jerk it back and break the aluminum stick into several pieces, or if he pauses now and then he will have a very irregular stick. The method is acquired by practice, however; and the correct temperature of the melted metal may also be learned by experiment.

The advantage of both of these methods lies in the fact that the rods are perfectly free from molding sand or other impurities if the table is wiped clean and dry before pouring the rods. They are not badly oxidized or porous. They have lost little of their ductility. They may be made fresh every day if it is desirable.

In this connection it is well to state that aluminum rods soon get a coat of oxide if kept on hand very long, due to the action of the atmosphere, especially if

exposed to the varying temperature of the average welding shop, where they are usually piled in an exposed position. Is it not better, therefore, to cast a fresh supply every few days than to wonder what is the matter with a weld and not know it may be injured by a filler rod covered with oxide?

Of course, these home-made cast filler rods will not be accurate as to size and length. Nor will they be the same thickness their entire length. But this will not be found to be a serious defect, since the thicker portions may be used on heavy jobs or for filling in large patches, while the thin sections are reserved for light welding. If necessary, the rods may be broken in pieces and tacked together with the torch into long rods more uniform in thickness.

Being rather flat, the rods are often found better on many classes of work because they can be spread over a larger surface than the round rods; which, as a result, tends to make less oxide to combat in a wide weld.

In closing, let me say that if this article has interested you, please write to the editor and say so. Perhaps we can arrange to furnish a lot of ideas by which you can equip your shop very cheaply and easily. In this connection I might add there are comparatively few shop devices, tools, or other equipment for the welder that are manufactured especially for him. Perhaps the manufacturer doesn't realize how important and immense the welding business has grown. So it is up to you to make a lot of your own apparatus, even though you would prefer to buy them.

Fall Automobile Accessories Drive

Whether the Automotive Dealer Believes in Window Displays or Advertising, or Both, He Should Get Busy for the Fall and Winter Business in Accessories—
Read What Others Are Doing by Way of Additional Appeal to Motorists

By Earnest A. Dench

The automobile dealer and repairer has certainly not the easiest task in the world in dressing his windows to display his auto accessories to the best advantage.

It is far easier, for instance, to trim a candy window because all the goods can be arranged on the same size display fixtures, with the result that a well-balanced effect is obtained without much effort. But with automobile tires and accessories, it is an entirely different proposition.

Tires are cumbersome articles to utilize for window displays and most of the accessories the automobile dealer sells run to the other extreme in point of size. To combine tires with auto accessories only tends to increase display difficulties, so it is best that tires and accessories be kept apart.

With the fall season coming on, there is an additional incentive to appeal to motorists—who are quite as susceptible to attractive window displays as are other classes of people.

A hardware dealer in Connecticut inaugurated an auto-users' sale, featuring in the local newspaper the fact that his "Windows Are Worth Coming to See."

Another dealer in Texas, knowing that the man who has just become the proud possessor of an automobile does not like to display his ignorance of the technical names for certain accessories, humored this profitable but sensitive type by announcing that

"You don't have to know the names of all the little auto sundries to be able to buy at our shop. Tell us what you want. We have it."

An automobile supply house in a large city at one time displayed their accessories

on paper doilies at equal distances apart on the floor of the window. The trim was encased by a background of isinglass with lattice work in the rear center, partly covered with a tire display card.

A very artistic display of automobile rugs was shown by one of the well known automobile supply houses of New York City. They floored their window with blue automobile rugs, while at the back it was screened with green automobile rugs, with a large one in the center, arranged like a curtain opening. On the floor at intervals were tires with large palms between.

A tire dealer in New York inserted at the rear of his show window a large painting of a soldier speeding along a country road in a roadster, accompanied by a pal and his lady friend. The floor of the window was covered with a layer of sand, over which pieces of broken bottles were laid. At each side reposed a tire on a display clasp.

The tires were accompanied by cards telling of their enduring qualities. For instance, the first card announced that "The Huns could not stop our boys—Broken bottles will never stop Keystone tires." The other card suggested: "Treat 'em rough—Keystone tires don't mind."

It pays also to make your advertising seasonable, but, at the same time, this kind of publicity calls for specific suggestions rather than generalities. A dealer in Indiana realized this in offering the following:

"In 'The Good Old Summer Time' you don't need them,

But now is the time to install our winter curtains,

They open with the doors, and

An Antidam radiator and hood cover; and besides

A perfect auto exhauster, then you will have comfort and satisfaction."

When Forer and Forer, Springfield, Mass., break into print, they generally do so by the Walt Mason poetical route, with the result that Springfield folks are keyed up to watch for the next contribution.

Here is a verse you can use:

"Don't let your car look ill this Fall.
Here is a tonic that beats all."

Another excellent example follows:

"We've everything your autos need
To bring them comfort, class and speed."

They recently pointed out that:

"The money spent here always buys
The best and makes you auto-wise."

The extensive stock carried was subtly suggested by another effort, as below:

"Perhaps you'll never need it, lad.
But if you do you'll need it bad."

And this is very much to the point:

"Should we not have the thing you need,

We'll get it with the proper speed."

A novel way of running a testimonial:

"Our patrons boost us to the skies.
They like our manners and supplies."

Whether the automotive dealer believes in attractive window displays or newspaper advertising, or both, he should get busy to take care of the fall and winter business immediately.

Readers' Questions and Answers

Selecting a Truck.

Question.—What truck would sell best in a territory where most of the farms are from 50 to 200 acres in size, under general farming? I want to take on some good truck, but do not know which one to select.

Answer.—We are sorry to say that it is the policy of this magazine not to specifically make any recommendations. For a territory such as you write of a good strong light truck about one-ton in size would be ample. Select a manufacturer, however, who makes trucks ranging from three-quarters to two tons, this will give you some flexibility in sales, for while the average farmer would want a one-ton truck several might want a larger one or a smaller one.

Generator Lubrication on Buick.

Questions.—1. What is the weight of the new Overland-4?

2. What is the bore and stroke? Horsepower?

3. What places on the generator of a 4-cylinder 1918 Buick should be lubricated, and how often?—E. P. H., Illinois.

Answers.—1. The weight of the new Overland-4 is 1,940 pounds, complete with gas, oil, water, tools, and tire carrier with extra rim.

2. The bore is 3½ inches, stroke 4 inches, and the engine is rated at 27 brake h. p.

3. There are five places to lubricate on this system. Referring to the side view of the generator, they are:

Oiler "A" is for the purpose of lubricating the bearings on the distributor shaft. This is a wick oiler and should receive enough oil to fill the oil cup every two weeks.

Oiler "B" is an oil hole for lubricating the ball bearing on the forward end of the armature shaft. This oil hole can be reached by removing the front brush cover, and should receive four or five drops of engine oil every two weeks.

Oiler "C" is for the purpose of lubricating the roller bearing at the rear end of the armature shaft. This should re-

Conducted by E. C. Pohlmann

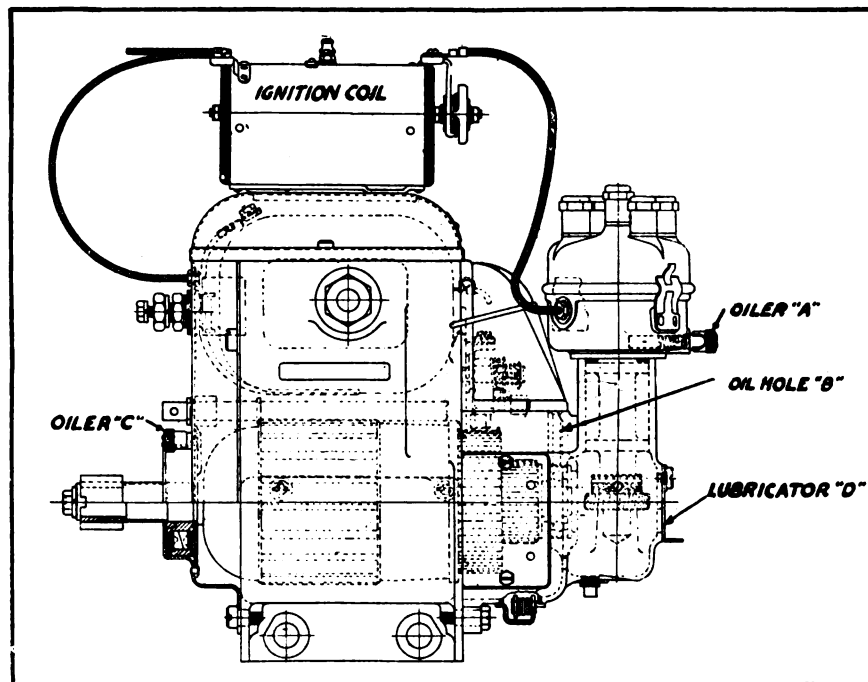
Get into the habit of asking questions! The more you ask about your business the more you will know, and the more you know the more money you can make. Do not hesitate to send in your questions, whether you are a dealer, a salesman, a mechanic, a service man, or a stockkeeper, they will be gladly answered.

Perhaps there is something you want to know about a certain car or truck or the specifications of some particular tractor or how to store repair parts, or increase the efficiency of your repair shop. We welcome queries about anything and everything connected with the automotive industry. When a quick answer is desired we will send a reply by mail, otherwise the answer will be printed in this department.

ceive four or five drops of engine oil every two weeks to prevent excessive wear.

In the forward end of the distributor housing, lubricator "D" should be supplied with soft cup grease for the distributor driving gears and overrunning clutch. This grease should be repacked about every six months and in winter, to make it flow more readily, a small amount of lubricating oil should be added.

The inside of the distributor head upon which the rotor button bears should be lubricated with a small amount of vaseline,



Side View of Buick-4 Generator Showing Places Which Require Lubrication.

to prevent the rotor button from wearing the inserts. It will not be necessary to lubricate this after the distributor and rotor become well polished, except to clean it with a rag soaked in kerosene.

Cleaning Automobile Tops.

Question.—I have been operating a small garage in a community consisting entirely of ranchmen who are called upon to drive many miles in the course of inspecting their large acreage. They have adopted the automobile for this purpose only during the last two or three years, and many are not so fully conversant with its mechanism as are owners or drivers of other communities. In operating my garage I have been called upon but very few times to completely overhaul cars, and only once have I been asked to go so far as to polish the body, paint the radiator, engine, manifold, etc., and to clean the top.

In one case my customer insisted that I use gasoline in cleaning the top, but I hesitated in doing so, being under the impression that this was not the right cleaner to use. Would you kindly advise me through the American Garage and Auto Dealer whether or not I am right, also any suggestions you may make that would enlighten me along this line?—M. M. K., Texas.

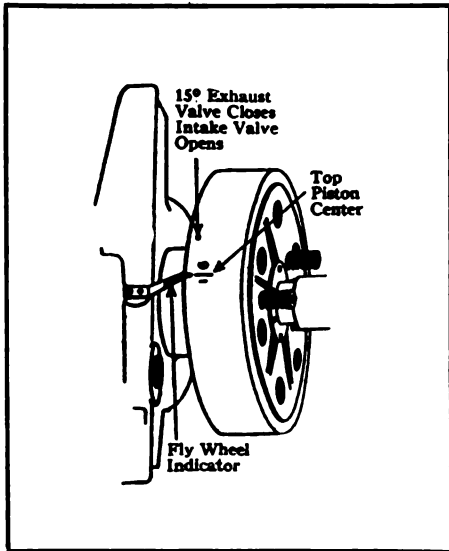
Answer.—You are perfectly right in refusing to clean an automobile top with gasoline, or even kerosene. The most satisfactory method is to first use a brush, after which clean thoroughly with soap, then go over with plenty of clear water so that no alkali spots will appear. If the top is of mohair, tepid water and castile soap is to be preferred. The soap should be placed in the water and worked by hand until a lather appears, then apply it to the top with the aid of a clean sponge. Pantasote tops, as well as curtains, should be cleaned with a brush dipped in a weak solution of ammonia and water, and then rubbed dry. If you should be called upon to clean a top that has been used for some time, we would suggest that you

use the following mixture: Half a pint of raw linseed oil; 4 cups of water, and half a cup of turpentine. This should be applied with a cloth and rubbed dry.

Do not under any consideration fold

the top until plenty of time has elapsed for it to become thoroughly dry, for the reason that moisture in the folds will cause mildew, as well as make the top leaky. If the car is not to be used for some time open the top, keeping it stretched and smooth.

There are many prepared dressings for leather tops on the market, though in an



Indicator for Timing Valves on Mitchell.

emergency the following recipe can be used for this purpose: One part of liquid asphaltum to two parts of castor oil. Add to this half an ounce of ivory black to each pint of the mixture. Apply this solution with a soft brush. It is also very good for a rubber top.

* * *

Adjustment of Tractor Carburetor.

Question.—Not very long ago I was called on by a farmer, to make some adjustment on the carburetor of his tractor. I never adjusted a kerosene and gasoline carburetor before, but managed to make the motor run a little better, although not to his satisfaction. This was a Kingston carburetor on the Avery tractor. Please explain the operation of this carburetor and also give the method of making adjustments.—J. S. D., Wis.

Answer.—The Kingston carburetor on the Avery tractor is a dual or double carburetor; that is, it has two bowls, one for gasoline and the other for kerosene. Gasoline is used in starting the motor and running it until the motor warms up, then it is switched to kerosene by turning the 3-way valve (not very clearly shown in the illustration).

Fuel should be kept in each bowl in

order to keep the working parts in proper condition, for if one carburetor is left empty, the vibration of the machine will ruin the float and valve in a short time.

The fuel supply to each bowl is controlled by needle valves No. 11. To adjust the needle valves correctly, run the motor up to speed, set the spark in the retarded position and proceed as follows:

Loosen each screw No. 12, and turn needle valve slowly to the right until the motor starts to backfire through carburetor. Now slowly turn the needle valve to the left until the motor picks up maximum speed. After the motor warms up and the proper adjustment has been made, the exhaust should be clear. Too much fuel produces black smoke.

When the motor is operating right tighten the notch-screw No. 12. The needle valve is the only adjustment on this carburetor. The auxiliary air is controlled automatically by the ball valves No. 25. This takes care of the mixture at all speeds above or below normal speed so that after the adjustment is once made on the needle valves no further adjustments are required.

When operating on kerosene, water should also be used. My means of a copper tube from the water manifold the water is taken in through the air tube directly with the air supply. This water is used to prevent the preignition of gas in the cylinders, also to prevent cylinders from overheating under light loads.

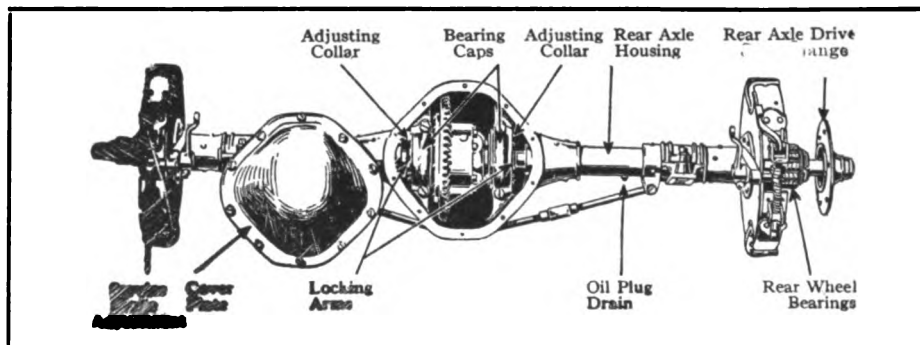
* * *

Adjustment of Mitchell Rear Axle.

Questions.—1. I have a 1916 Mitchell which makes a humming noise in the differential. I have tried to adjust the bevel pinion to eliminate this noise, but have not been very successful. Will you explain in your next issue the method of making adjustments on this model?

2. Give me the valve timing for this model.—C. M. G., Indiana.

Answers.—1. To adjust the rear axle remove the small plate at the forward end

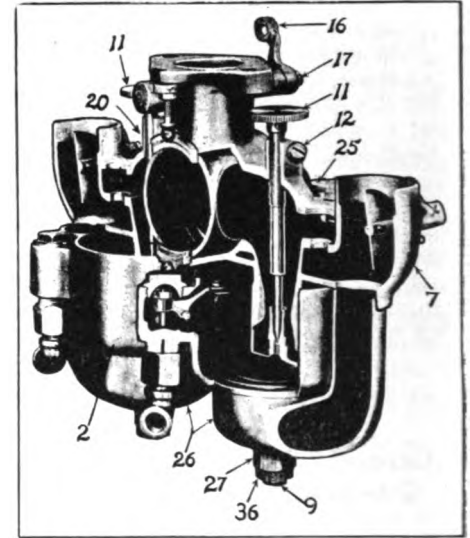


Rear Axle of 1916 Mitchell, Showing Differential Adjustments.

of the rear axle housing and by means of a tool placed in one of the slotted holes turn the adjustment collar to the right to mesh the gears tighter. For proper adjustment the heels of the bevel gear and

pinion should be flush. With worn gears, however, this is not always possible and hence it is a very good idea to make this adjustment while driving the car on a smooth road. The adjustment can be easily reached by removing the floor board.

If the above adjustment does not accomplish the desired result it may be necessary to change the position of the large drive gear. To do this, remove rear



The Kingston Tractor Carburetor.

axle cover plate (see illustration), then remove the four studs holding the two locking arms, one on each side and by turning the collars the large drive gear together with the whole differential can be moved to the right or left.

Be very careful in making this adjustment for this is a give and take operation; for instance, if the collar on the right is turned up one notch the collar on the left must be turned in the opposite direction one notch and vice versa. The adjustment of rear axles is a very tedious job and sometimes several attempts will have to be made before the noise is eliminated.

2. Attached to the crank case at the flywheel is a metal indicator (see illustration) which when in line with marks on the flywheel determines the relation of the pistons. When the long mark 1-6 is in line with the indicator, pistons number one and six are at their highest points or upper dead center. When mark 3-4 is in line pistons three and four are on upper dead center.

When the piston of any particular cylinder is on its suction stroke and the punch mark on the flywheel is in line with the indicator the exhaust valve of this particular cylinder has just closed and the intake valve begins to open.

Tentative Chart of Accounts Set Up

An Analysis of the Accounts Outlined in the "Liabilities Division" of the Tentative Chart of Accounts Set Up for Automotive Dealers—
Criticisms or Suggestions from Readers as to Variations Are Welcomed

By J. Newton Boddy

Manager, System Department, Tanner, Gilman & Ellis, Chicago

In this article the writer has to return to the August issue to answer a criticism of his treatment of the account "Cost of Sales."

First of all I was asked "Why is Cost of Sales shown in the revenue rather than in the expense division?" There are two reasons for carrying Cost of Sales in the revenue division. First: Sales and Costs of Sales are complementary accounts. That is, both must be taken together to make the true revenue account. These two accounts in reality should have been bracketed in setting up the chart.

Second: Although many bookkeepers set up "Cost of Sales" as the first of the expenses, still "Sales" and "Cost of Sales" are shown in order named on income tax statements as required by the government to show gross profit on sales, or revenue. There is still another reason, which might be mentioned here—a somewhat technical one. "Cost of Sales," when applied to each sale, becomes one of a group of accounts known as clearing accounts—others of this account are "Cash Sales" and "Payroll."

This discussion has opened up another question which it seems advisable to comment on at this time. In writing a series of articles on garage accounting some of them will be what might be called "text-book" articles and as such may make dry reading to some of our readers interested in this department. By mail one loses to a large extent the personal touch enjoyed in direct personal contact with the client—and all readers of the AMERICAN GARAGE & AUTO DEALER are clients or prospects.

In my experience as a salesman of garage accounting, I hit the high spots only, sold a customer thoroughly on the general plan, and promised him that all general details would be taken care of as the transactions were posted in the records. I found early in my experience that if a thorough explanation of the details were attempted the usual answer was "Too much Red Tape" or "Too much Detail."

Remember this: "We learn to do by doing." We can supply you with the tools, the equipment, or in other words, the system. Give each of these articles your careful consideration, for they will ultimately form a complete

manual or text-book on garage accounting. Your careful reading of these articles now will later, when you are using this system, enable you to get information from your text-book more readily.

We will now proceed to an analysis of the "Liabilities" division of the tentative chart of accounts. As these accounts are offsets to the asset accounts, the order of handling will be reversed and credit side shown first.

Notes Payable: Credit this account with the amount of all promises to pay that have been issued and debit it with all payments made on such

Is your bookkeeping system satisfactory? I say, is it satisfactory? Can you tell any time and always just where you are at financially without a lot of figuring and estimating.

notes or with amount of renewals when old note is canceled. The balance on this account will show the amount owed by the firm covered by notes.

Accounts Payable: Credit this account with the amount of all invoices for purchases of the firm. Debit the account with amount of all remittances to the purchase accounts, with amount of discounts taken on bills, with amount of rebates and allowances taken, and with amount of other credit memos issued the firm by the accounts payable or vendors.

Notes Receivable Discounted: Credit this account with the amount of all notes receivable discounted and debit it with the amount of the discounted note paid or canceled. The balance will show the amount for which the firm is liable should the original maker fail to meet his obligations. As these notes are liabilities only in case the original maker fails to meet his payments, they are commonly called a contingent liability.

Referring to our last article, we repeat that we believe the best practice for the average automotive dealer will be to carry "Notes Receivable Discounted" as a liability to be cleared the same time as "Notes Receivable":

that is, when you have been notified that "Notes Receivable Discounted" have been paid, "Notes Receivable" will be credited and "Notes Receivable Discounted" debited by the amount. It is becoming a common practice to carry "Notes Receivable Discounted" in the assets division bracketed with "Notes Receivable" in the same manner that we carry "Cost of Sales" in the revenue division bracketed with sales account.

Deposits Payable: Credit this account with the amount of the cash deposit received to bind a sale. Debit the account by the same amount when the sale is completed. The balance will be the amount owing customers for deposits on incomplete sales. Except in cases where your customer may be a sub-dealer, I believe in crediting these cash deposits directly to accounts receivable and thereby eliminating the deposits payable account from our books.

Payroll: Credit this account with amount of wages and salaries accrued for any given pay period. Debit it with amounts issued to meet wages and salaries secured. Where the number of employees is small, the account payroll is usually dispensed with, amounts issued to cover wages and salaries being charged direct to wages and salaries by departments.

"Payroll," as stated earlier in this article, belongs to the group of accounts called clearing accounts. It will show a balance only when the pay day and accounting day, or statement day, fall on different dates, in which case the balance on payroll shows the amount accrued but not due on wages and salaries and is generally shown in the accrued payables.

Accrued Payables: This account includes all such accounts as rent, heat, light, water, power, gas, taxes, wages, salaries, etc. As bills for these expenses are rendered at regular intervals usually monthly, and as in many cases the amount varies from month to month, we cannot make a true statement of our indebtedness without showing these amounts on our books whether they are due or not.

Credit these accounts with the amounts of the expense bills rendered or the amounts actually accrued though bills may not be rendered, and

debit them when the accounts are settled. These accounts are seldom carried on the average garageman's books. This is one of the gravest errors of many bookkeeping systems.

Allowance for Doubtful Accounts: This account is set up to anticipate losses on accounts or notes receivable due to bad debts. In setting up this account, two methods are in common use. One is to figure a certain percentage of the accounts receivable or notes receivable; the other is to use only past due accounts or notes and figure that a liberal percentage of these will become bad debts. Of the two methods, the latter is preferred.

Credit the account with amount set up to anticipate losses due to bad debts. Debit the account with all amounts written off as bad debts. The balance will show the amount estimated to take care of losses by bad debts.

To simplify the statement of "Assets and Liabilities," "Allowance for Doubtful Accounts" should be carried in the assets division in the same way that notes receivable discounted are carried there. The accounts appear in this order: "Notes Receivable," "Allowance for Doubtful Notes," "Accounts Receivable," "Allowance for Doubtful Accounts Receivable." It is not necessary to set up "Allowance for Doubtful Notes Receivable" except when "Notes Receivable" contain unsecured notes.

Allowance for Depreciation on Merchandise: It will not be necessary to set up allowance for depreciation on merchandise except for used cars and possibly demonstrators. The usual current inventories should not show any depreciation. As in case of allowance for doubtful accounts, "Allowance for Depreciation on Merchandise" should be carried in the assets division immediately following the account merchandise.

Credit this account with amount estimated to cover loss by depreciation. Debit the account when the car is sold, or disposed of, by the amount of depreciation set up for this particular item. The balance will show the amount of allowance provided for on the current inventory.

Allowance for Depreciation on Shop Equipment: This account should show the estimated amount set up to anticipate losses by depreciation on tools, dies and jigs, machinery and shafting, benches and cabinets, and other equipment. Small tools, though part of shop equipment, need not carry depreciation but should be charged off directly to small tool expense.

The better plan is not to include

small tools as a part of shop equipment, but to carry them separately as an expense account, including the balance on hand at closing period as part of shop supplies inventory. The loss on small tools is not caused by usage, but by theft and loss by carelessness.

In general, the remarks on allowances, depreciation, merchandise, apply equally to this account. This account should appear on your statement of assets and liabilities in the assets division following the account shop equipment.

Allowance for Depreciation on Office Equipment: This account should show the estimated amount set up to anticipate losses by depreciation on desks, chairs, clocks, safes, registers, files, carpets, binders and sheet holders, railings and partitions, typewriters, adding machines, etc. Depreciation should be estimated on each item separately. In general, the remarks on allowances for depreciation

Keep close watch of your bank account. To check along blindly without knowing whether you are overdrawing the account or not is about as sensible as to jump off a precipice in the dark.

merchandise apply to this account. This account should appear on your statement of assets and liabilities in the assets division immediately following the account office equipment.

Allowance for Depreciation on Buildings: This account should show the estimated amount set up to care for anticipated loss due to depreciation of buildings. Depreciation should be estimated on each unit separately, depreciation depending on the structure of the building, wooden, cement, brick, reinforced, etc. The government income tax reports suggest reasonable allowance for depreciation of buildings which it would be well to adhere to as closely as possible. In other words, you must have a reasonable explanation for the percentage used in setting up your depreciation.

In general, the remarks on allowance for depreciation merchandise apply to this account and should appear on your statement of assets and liabilities in the assets division immediately following the account, "Buildings and Real Estate." Let us here suggest "Land and Buildings" as a better name for this last-mentioned account.

Capital Stock: This account represents the total par value of the issued shares of the company. Although the capital stock account is probably kept only when it shows the issued

capital stock, still accounts should be carried with capital stock authorized and capital stock unissued, the difference representing capital stock. Capital stock may be of two kinds—preferred or common. If both kinds are issued, it will be best to set up the accounts "Capital Stock Preferred" and "Capital Stock Common."

Capital Stock Authorized: Credit with total par value of authorized capital stock; debit with the par value reduction of capital stock when such reduction has been properly authorized. This latter happens so seldom that we may consider capital stock authorized has a credit side only.

Capital Stock Unissued: Debit with par value of unissued stock; credit with par value of stock as issued also with par value of reduction of authorized stock. Balance on this account should represent par value of unissued capital stock. As capital stock unissued carried a debit balance, it is sometimes carried in the assets division in the statement of assets and liabilities.

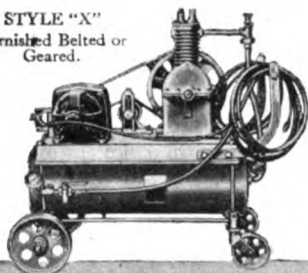
Surplus: This account represents the undivided profits of the business. Credit at the opening of the books with the amount of excess between assets and liabilities, including capital stock, with amount of any adjustments made in the current accounting period which affect the profits of the earlier period and with the amount of gain transferred from the profit and loss account at the end of each accounting period.

Debit at the opening of the books with the amount of excess of liabilities, including capital stock over assets (surplus in this case is termed deficit), with amount of any adjustments made in the current accounting period which is a charge against the profits of an earlier period, and with the amount of loss transferred from the profit and loss account at the end of each accounting period. The balance—the difference between the debits and credits of this account—should represent, if a credit, the individual profits; if a debit, an impairment of the net worth, or a deficit.

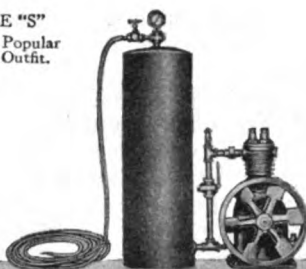
Profit and Loss: This account is often called "Loss and Gain" but "Profit and Loss" is the preferable because profits or revenues are more logically shown before expenses or losses in financial statement.

This account represents the difference between the revenues and expenses from all sources at the end of a closing period. It is profit when revenues are in excess of expenses, and a loss when expenses are in excess of revenues. No entries should be made to this account except at accounting periods. Credit this account

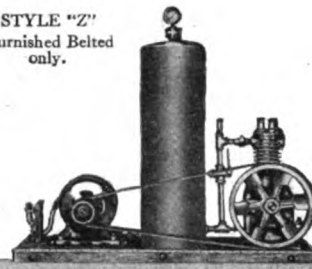
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with amount of sales, interest earned, discount earned, and sundry income. Debit it with cost of sales, service expense, sales expense, general expense, interest allowed, discount allowed and sundry deductions. The balance—the difference between the credits and debits of this account—represents the profit or loss of the business for the period and should be transferred to the surplus account or undivided profits account if such an account is carried on the books. Capital stock, surplus and profit and loss, with undivided profits sometimes added, are what are termed the "net worth" accounts for a corporation. We will now analyze the accounts that make up the net worth of an individual or partnership.

Investment: Credit at opening of the books with the proprietor's or partner's share of the net investment in the business, with all additional investments, with the credit balance if any is transferred from the proprietor's or partner's personal account—with the net profits transferred from

the profit and loss account at end of a closing period in the case of partnership with the partner's share of net profits so transferred.

Debit with withdrawal of all investments previously credited to this account, with all losses not applicable to the current year's operations, with debit balances if any is transferred from the proprietor's or partner's personal account, and with net loss if any is transferred from the profit and loss account at end of a closing period in case of a partnership with the partner's share of net loss so transferred. The balance, after profit and loss has been transferred to it, represents the net worth of the business, or in case of partnership, each partner's share of the net worth of the business.

Undivided Profits: When profit and loss is not transferred directly to "Investment," it is transferred to this account where profit and loss is figured monthly, or oftener than once a year. The setting up of an undivided profits account in which to accumu-

late profit and loss is recommended. In this manner "Profit and Loss" represents the result of operations for the current accounting period only and is closed into "Undivided Profits" which, in turn, at the end of the year is closed to "Investment."

Where it is considered advisable to show the original net investment as at the end of some particular period, we do not close profit and loss into undivided profits until the end of year where it remains until closed to investment accounts.

Credit: With amount of profit transferred from profit and loss account, with amount of profit adjustments affecting prior periods. **Debit:** With amount of loss transferred from profit and loss account, with amount of loss adjustments affecting prior periods, with amount of profit withdrawn from business by the proprietor or distributed to the partners.

Profit and Loss: In general, the remarks on profit and loss account for a corporation apply equally well to a proprietorship or partnership.

Dairy Grows With Its Truck Fleet

Los Angeles Milk Merchant Replaces a Single Horse and Wagon with His First Truck Five Years Ago After Making Careful Investigation to Determine the Type of Truck Best Fitted for His Business—Is Now Operating Six Trucks

There is no business in which more rigid standards are maintained than in the handling of milk. Every city has carefully fixed requirements as to the milk that can be sold and these requirements must be met.

The maintenance of these standards is not merely a matter of dairy equipment. It depends also on the man in the organization, and on the handling of the product on an absolute schedule.

Transportation plays a large part in this work—reliable and dependable motor trucks are an absolute necessity in large city distribution of milk.

The Western Farms Dairy Co. of Los Angeles has achieved a great success in this work. The letter from H. G. Pendell, Denby distributor at Los Angeles, to the Denby concern, that is quoted below gives an excellent insight into the methods responsible.

"I am sending you

a couple of photographs, one showing the new building of the Western Farms Dairy and the other a photo of the latest Denby I have sold to them.

"I sold Hugh J. Boyle of the Western Farms Dairy his first truck more than five years ago, when he was operating a horse and wagon from a small place about 15x30 feet, near the site of their present modern plant. About six months later I received another order from Mr. Boyle, and so on successive orders until the sixth order, on

which delivery was made a few days ago.

"In all this period of business relations I saw very little of Mr. Boyle himself and had but slight opportunity to learn the secret of his success. I knew from the constant enlargements of his business that he was working under a definite successful system and last week I determined to learn at first hand the reason for the rapid growth of the Western Farms Dairy.

"In answer to my query he expressed it briefly as standardization. 'We have stand-

ardized on all product, on our delivery equipment, on our labels, even on uniforms worn by our drivers, and above all things, we hold absolutely to the standard.'

"How well he has succeeded in this standardization was attested by Dr. Rosenberger, chief of the city milk inspection service, who states that the milk from the Western Farms Dairy never varies more than one-tenth of one per



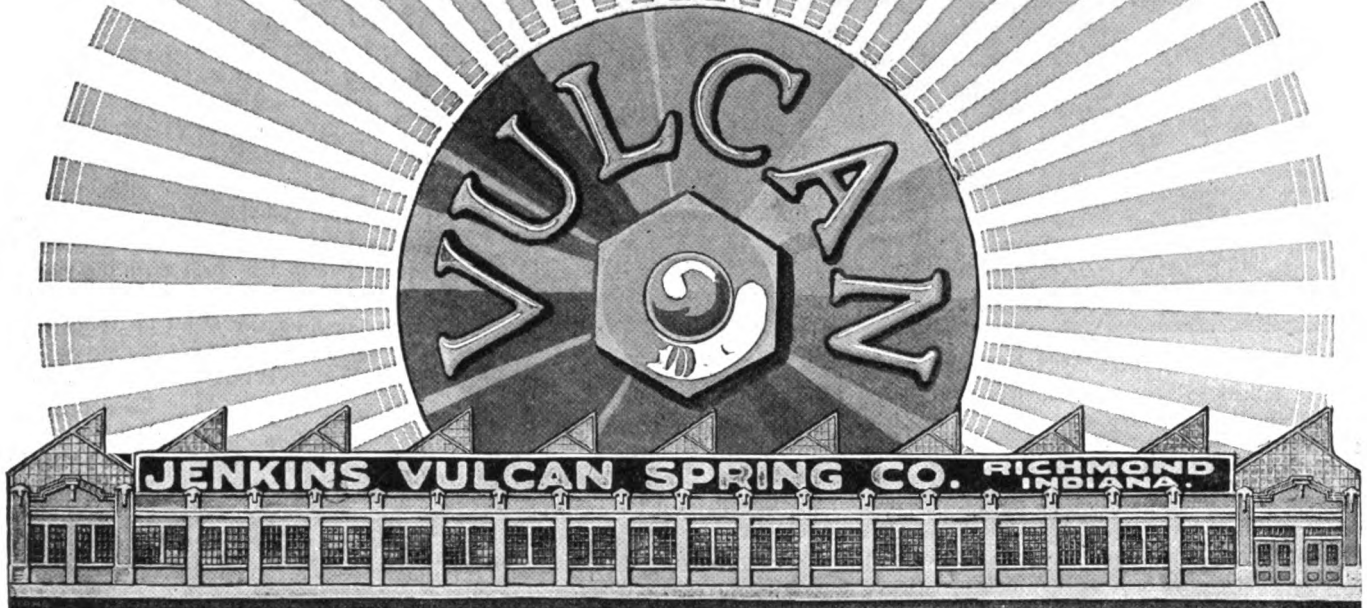
One of the Six Trucks Used for the Delivery of Milk. [

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The Replacement Spring



The VULCAN Name-plate insures absolute protection to the dealer.

When you sell a replacement spring bearing the round VULCAN name-plate you know that spring has been made right and will give complete satisfaction. It protects your future business and your profits.



Unscrupulous jobbers have substituted inferior springs for VULCANS, in the past. We want every dealer to realize that the VULCAN name-plate is his assurance of real VULCAN quality and VULCAN profits, which are high. Look for the name-plate on every spring; when you find it you know you're right.

*The VULCAN name-plate is a symbol of
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for **EVERY CAR**

cent. Mr. Boyle did not explain how he managed to keep his milk within these close limits, but after seeing the keen-eyed little man hard at work with test tubes in the laboratory at the plant I can guess.

farm at the same time, and large quantities of farm produce which do not reach the market because of lack of transportation are wasted.

"Motor express lines increase the food

damage to roads; one is the impact of weight; the other is wear to the surface.

"With a substantial roadbed the impact of weight does little damage. If the roadbed is faulty, weight tends to break it. It is simply a matter of gravity.

"Perhaps the greatest destroyer of road surfaces and the least condemned is the steel tire. The steel tire hits the roadway with an absolutely unyielding impact. Its constant hammering crushes stones and shatters all particles that project from the surface of the road.

"Steel tires are usually narrow and they wear and cut deep tracks and ruts. They pulverize the surface, so that automobiles, with the suction of their pneumatic tires, suck up the dust that is formed and scatter it to the winds.

"The motor truck with its broad, flat rubber tires and slow speed, compared with that of the automobile, causes practically no damage to the surface of the road. It causes no abrasion and there is no suction from the solid tires. Of all traffic on the highways, the motor truck does the least damage to the surface of the road.

"It is for the people to insist that legislation governing motor trucks be intelligently formulated. As the use of the motor truck becomes more and more an everyday matter, much of the narrow-minded hostility manifested in certain circles at this time will be completely overcome.

"It is for voters to use their own judgment and their influence."



The New Offices and Home of the Western Farms Dairy Co.

"I have talked to several customers of the Western Farms Dairy Co. and they all tell me that they know absolutely what they are getting.

"The same rigid standardization is followed on their delivery equipment. They spent considerable time and money in determining what truck was best fitted to their needs, and having determined that the Denby was by far the best they are confining all their purchases to this equipment.

"In this way their men need familiarize themselves with only one mechanism. This inevitably leads to better and easier maintenance. Whatever outside service is required comes only from the one organization which in turn makes for dependability.

"Standardized equipment is the end we are working toward wherever possible in our sales effort here in Los Angeles. It is impossible to get the best results from the truck which is one of a large fleet of different makes operated by one concern. It is working under a handicap, as regards operation and maintenance cost, and cannot show the result it would if the fleet were all of the same make. We find that owners realize this where it is called to their attention, and have been very successful in getting them to standardize on Denbys after assuring themselves of the superior performance and economy of these trucks."

Value of Motor Express Lines to Relieve Railroad Congestion.

"The safety of our country depends on transportation," says Geo. D. Wilcox, director of sales and advertising of the Commerce Motor Car Co. "Railroads are so congested that they cannot carry all our food and other supplies. Farmers cannot haul crops on the road and work on the

supply by furnishing regular transportation for our farm products. They stimulate the farmer's efforts in production, and at the same time enable him to obtain goods from town on the same day of the order.

"The consumer is able to get fresh fruit, vegetables, milk, and eggs on the day they leave the farm, and is willing to pay a higher market price."

Motor Trucks Do Least Damage to Highways, Says R. E. Fulton.

There seems to be a tendency on the part of some who have not thought deeply on the subject to foster the idea that the only wear to roads comes from the use of the motor truck.

"A few years ago the automobile met with this condemnation," says Vice-president R. E. Fulton, of the International Motor Co., "but the automobile is now a thing of such common use that hardly any one finds fault with it any more.

"The motor truck is rapidly becoming the nation's freight carrier. While it is not true, there are people who believe it comes in direct competition with existing means of transportation of supplies, especially in rural communities and between cities.

"There has been some unwise legislation against motor trucks as a result of such an attitude. But with motor trucks hauling more than 350,000,000 tons of farm products a year, the people can hardly sit idly by and allow legislation based on false ideas to hit at the very source of their life supply.

"Of all vehicles using our highways, the motor truck probably causes the least damage in proportion to the service it renders. There are two things that cause

Value of Motor Truck in Live Stock Hauling Demonstrated.

A demonstration of the value of live-stock hauling by motor truck was conducted recently in Mason, Iowa.

At the conclusion of the North Iowa Fair, held at Mason City, the promoters of the fair were confronted with the problem of returning the live stock which had been sent in for exhibition. It happened that 17 trucks sent out on a development tour by the National Association of Motor Truck Sales Managers were in Mason City. Some of these were pressed into service and the stock, which had taken from three to four days to come in by rail, was returned to their farms in as many hours.

At Rugby, N. D., a similar comparison was made between truck and horse transportation. Just outside of Rugby, a little more than eight miles, is the big Whipple farm. One of the trucks went out to the farm and took a load of 3,660 lbs. of threshed wheat, hauled it back to Rugby and unloaded it into the grain elevator.

The trip was made over rough roads in 28 minutes, the return trip in 32 minutes. Teams took more than two hours to make the trip one way and two loads were considered a full day's work. The truck could easily have made eight trips a day.

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The Three-Piece Snap Piston Ring

In heavy structures — and in TRIONE Piston Rings — strength is obtained by the angle beam.

And science demands in a piston ring results that can be obtained only by three-piece construction. The TRIONE angle beam inner ring gives the three-piece ring the strength that makes it practical.

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| Dallas | - | - | Texas |
| Atlanta | - | - | Ga. |
| San Francisco | - | - | Cal. |
| Kansas City | - | - | Mo. |
| Minneapolis | - | - | Minn. |
| Seattle | - | - | Wash. |

Date _____
BAILEY-DRAKE CO., Inc.
 1120 South Michigan Ave. CHICAGO, ILL.
 Gentlemen: Send full information and prices on
 Trione Piston Rings. Also a copy of your booklet.
 Business _____
 Name _____
 Street _____
 Town _____
 State _____
 AG-10-9

Moving the Stockroom to an Office

One Live Automotive Merchant Has Developed a System for Keeping an Accurate and Up-to-the-Minute Account of Every Kind of Accessory and Part that Is in the Bins or on the Shelves of His Garage Stockroom

A travel-stained motor car, much be-pennanted and license-tagged, ambled into the garage of the Peterson Motor Co. Out of the car clambered a duster-clad young man who addressed one of the garage mechanics. "Touring," he explained laconically.

"Busted the rear spring about twelve miles out of here. Have tried four other places; couldn't get a new one. Got to hurry along. Want to know if you've got a spring and can put it in, in a couple of hours?"

"Just a minute," said the mechanic and he disappeared into the little office enclosure in one corner.

In a minute or two he reappeared. "Yes," he told the tourist. "We have a spring and can fix you up."

The automobilist grinned. "Do you keep your stock of spare parts in the office?" he asked.

The mechanic grinned back. "Absolutely," he said. "And we've got the best little system for keeping stock you ever saw. That's the reason we've got something that you couldn't find in four other places. And that's why we know we've got it. The idea is—we know what we're going to need before we need it; and after we've got it we know how to keep track of it."

As a matter of fact, the Peterson Motor Co.'s stock of automobile supplies and spare parts is kept in the office. That does not mean that car-

buretors and clutches, fuses and flywheels, rockerarms and radiators, windshields and whatnot actually are piled on top of desks and filing cabinets. But as far as keeping the office in touch with the stockroom is concerned, the general effect is as if

future and his garage is able to render just the sort of minute-notice service that is pulling patronage and making the Peterson Motor Co. a successful enterprise.

Every type or size of every kind of article in the Peterson stockroom has a record of its own—a page in a ledger. And this ledger is kept posted up to date as supplies are received and used.

Records, intelligently planned and intelligently kept, are keeping Peterson in touch with his stockroom. And other records, equally adequate, are keeping him just as closely in touch with all other phases of the business.

Peterson was a pioneer in the garage world in his city. The building in which his firm is located was erected in what some of his competitors—and even some of his friends—considered a locality far from promising. But trade went to the Peterson garage, and the

establishment was the nucleus for what is now a considerable "automobile row."

In the matter of management methods, also, the Peterson garage blazed a trail. Its accounting system—the system of which the stock record is only a part—is a forward step.

Take the matter of employees' wages, for instance. Before 1917, the recording of wages paid was mere-

| Part No. | Article | Max. | Location | Card No. |
|----------|---------|------|----------|----------|
| 812 | Bolt | 500 | 1 | 1 |
| | | Min. | Unit | Size |
| | | 50 | 1 | 3 |
| | | | | Price |
| | | | | 10¢ |

| QUANTITY ORDERED | ORDER NUMBER OR FOLIO | DATE | MEMO | RECEIVED | DELIVERED | PREVIOUS BALANCE | IN STOCK |
|------------------|-----------------------|-----------|------|----------|-----------|------------------|----------|
| 500 | 12,155 | JAN 1 | | | | | .49 |
| | | 5 JAN 5 | | | .06 | .49 | .43* |
| | | 15 JAN 15 | 4.00 | | | .43 | 4.43* |
| | | 35 JAN 25 | | | .10 | 4.43 | 4.33* |
| | | 7 FEB 4 | | | 4.00 | 4.33 | .33* |
| 500 | 14,555 | FEB 5 | | | | | |
| | | 55 FEB 15 | 1.00 | | | .33 | 1.33* |

| SALARY ACCOUNT | | | | | | | |
|----------------|--------|-----------|-------|--------|------------------|---------|--|
| Name | Rating | Card No. | | | | | |
| H. R. Rawlins | | | | | | | |
| Address | Limit | Acct. No. | | | | | |
| Machinist | | | | | | | |
| FOLIO | DATE | MEMO | DEBIT | CREDIT | PREVIOUS BALANCE | BALANCE | |
| | JAN 5 | | 15.45 | | | 15.45* | |
| | JAN 12 | | 21.34 | | 15.45 | 36.79* | |
| | JAN 19 | | 17.67 | | 36.79 | 54.46* | |
| | JAN 26 | | 19.72 | | 54.46 | 74.24* | |
| | FEB 2 | | 20.00 | | 74.24 | 94.24* | |
| | FEB 9 | | 19.50 | | 94.24 | 113.74* | |
| | FEB 16 | | 21.50 | | 113.74 | 135.24* | |
| | FEB 23 | | 21.50 | | 135.24 | 156.74* | |
| | MAR 2 | | 21.50 | | 156.74 | 178.24* | |
| | MAR 9 | | 20.50 | | 178.24 | 198.74* | |
| | MAR 16 | | 21.50 | | 198.74 | 220.24* | |
| | MAR 23 | | 21.50 | | 220.24 | 241.74* | |
| | MAR 30 | | 22.00 | | 241.74 | 263.74* | |

Here Are (Above) A Specimen Stock Ledger Sheet and (Below) A Typical Employees' Wage Ledger Page Used by the Peterson Motor Co.—Both Forms Are on a Reduced Scale.

the latter had been moved into the former.

L. A. Peterson, manager of the company, and his assistants, know what is in the stockroom—without going inside its doors to find out. Peterson knows the exact number of every type of automobile part from bumper to tail-light that he has in stock. And possessed of this knowledge, Peterson buys supplies with an eye to the



Figure it Out Your Self

Just take that pencil out of your vest pocket or from behind your ear and do a little figuring yourself.

How many Gas Engine Cylinders are there in your neighborhood that you know of which need re-boring right now?

How many do you suppose there are that you know nothing about?

Some Gas Engine Cylinders to Re-Bore every day —not one day—but every day—tomorrow and the next day

Maybe you are passing these jobs up because you can't make money on them; if you are, it is because you haven't the right equipment.

Get a Marvel No. 5 and you'll never pass up another re-boring job.

There is big money in cylinder re-boring; all Marvel owners say so.

Be a Live Wire— Get MARVEL PROFITS

Marvel users everywhere are making extra profits with the Marvel Cylinder Re-Boring Machine No. 5.

It is the fastest, most accurate worker you ever saw. It is power driven, has speed and capacity, handles any Gas Cylinder Engine from a Motorcycle to a Tractor.

The Marvel No. 5 has proven the best by every test—it is used and endorsed by hundreds of Automotive Repairmen and Colleges.

Our Co-operative Business Building Advertising gets the business.

A Marvel owner in a Colorado town, population 600, September 18, 1919, wrote: "At present time I have three mechanics working in my small shop. I attribute most of my success to your machine, for when we repair a car we generally re-bore. Your prescription for sick motors was a real success as I have 30 inquiries from people I mailed them to."

It's the same everywhere—in cross-road hamlets and in metropolitan centers, in county seats and rural districts, when a Marvel No. 5 is installed, the owner gets the business.

The Marvel No. 5 pays for itself in a short time—after that it's all velvet.

MARVEL MACHINERY COMPANY
510 Loan and Trust Bldg. Minneapolis, Minn.



MARCO OVERSIZE PISTONS

Manufactured exclusively for owners of Marvel Cylinder Re-Boring Machines. CATALOG FREE



MARVEL NO. 5
THE MACHINE
THAT ADDS
PEP TO SICK
MOTORS AND
SWELLS YOUR
BANK AC-
COUNT.

THERE IS ONLY ONE MARVEL

Use the Coupon

Here's your opportunity for big money. Don't pass it up. Find out about our proposition. Just the thing for live wires. Interested? Clip the coupon—or send a postal for the facts. Now's the time—today.

MARVEL MACHINERY CO.
510 Loan & Trust Building,
Minneapolis, Minn.

WE ARE INTERESTED. Without any obligation on our part—please send full information regarding the Marvel Cylinder Re-Boring Machine No. 5. Tell us how the Marvel No. 5 and your Co-Operative Business Building Advertising will make us money. Explain about Marco Oversize Pistons and why we should use them.

Name

Address

City and State.....

A new way to find every engine trouble

EASY, QUICK, POSITIVE!

THE HEMPY-COOPER
Motor Tester is another
of the real helps to a motor-
ist and repairman sold under
"The Fairbanks Company
O. K." Some of the others
are

Motor Testers
Bearing Burning-in Ma-
chine for Ford and Ford-
sons
Motor Test Stands
Engine and Axle Stands
Bearing Boring Machines
and Re-Babbiting Jigs
Cylinder Re-boring Ma-
chines for Fords and
Fordsons
Straightening Presses
Arbor Presses
Power Grinders
Air Compressors
Transmission Reaming
Machines
Special Ford Reamers
Rear Axle Sleeve Pullers
Radiator Test Plugs
Piston Clamps
Connecting Rod Straight-
ening Jigs
Bench Motor Clamps
Transmission Drum Clamps
Rear Axle Pinion Gear
Presses
Pinion Gear Pullers
Piston Boring Reamers
Crank and Cam Shaft Test-
ing Machines
Emergency Wheel Clamps
Wheel Pullers
Valve Port Renewing Tools
Bushing Drivers
Turning Bars
Speed and L. Wrenches
Special Jacks
Rim Tools
Tow Bars
Combination Electric Drills
and Valve Grinders
Visible Measuring Gas-
oline Pumps
Special Ford and Fordson
Tools and Machines

All are listed in Catalog 8—
ask for your copy.

Here is a quick way to find the cause of any trouble in a
gasolene engine of any type. No more cranking a "dead"
engine; no need to run an engine idle while you guess
what is wrong.

Suppose a customer drives up with an engine that is not
working properly. Instead of a tryout on the nearest hill,
open the hood, take out the spark-plugs and screw a

Hempy-Cooper Motor Tester

in the place of one of them.
Bring the piston up to compres-
sion dead center, and the value
on the tester tells just what the
compression is and how fast it
leaks off. Now let the handle
up and bring it down sharply.
You can hear air hiss through
a leaky inlet valve and out
through the carburetor. If the
exhaust valve leaks, you can
hear the air rush through the

manifold and into the cylinder
that is on exhaust cycle.

Other faults can be found with
the Hempy-Cooper Tester.
Loose bearings, loose piston
rings, piston slap, for each
there is a positive indication.
You can keep right on testing
as you adjust.

A Hempy-Cooper Tester takes
guesswork out of your testing
—with it you can tell your pa-

The

FAIRBANKS

MILL, MINE & RAILWAY SUPPLIES - SCALES - VALVES - POWER TRANSMISSION - MACHINE TOOLS

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

while not running

trons exactly what is wrong, how much it will cost to fix it, and how long the job will take. The very simplicity of the Hempy-Cooper Tester is evidence of its reliability. There are no valves to get out of order, no springs to break, no small parts to lose. Just screw it in place and you are ready to test.

DEALERS

A good thing to show to the mechanically-inclined motorist. Fully protected by patents.

THE FAIRBANKS COMPANY

Administrative Offices, New York

| | | |
|------------|--------------|------------|
| Albany | Detroit | Pittsburgh |
| Baltimore | Hartford | Providence |
| Birmingham | Newark | Rochester |
| Boston | New Orleans | Scranton |
| Bridgeport | New York | St. Louis |
| Buffalo | Paterson | Syracuse |
| Chicago | Philadelphia | Utica |
| | | Washington |

Havana, Cuba; London, England;
Birmingham, England; Glasgow, Scotland;
Paris, France.

Sole Distributors for

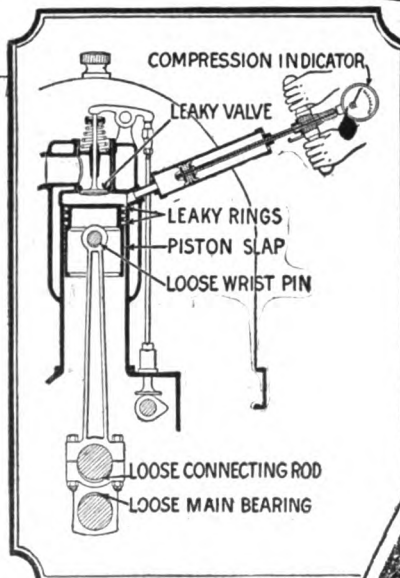
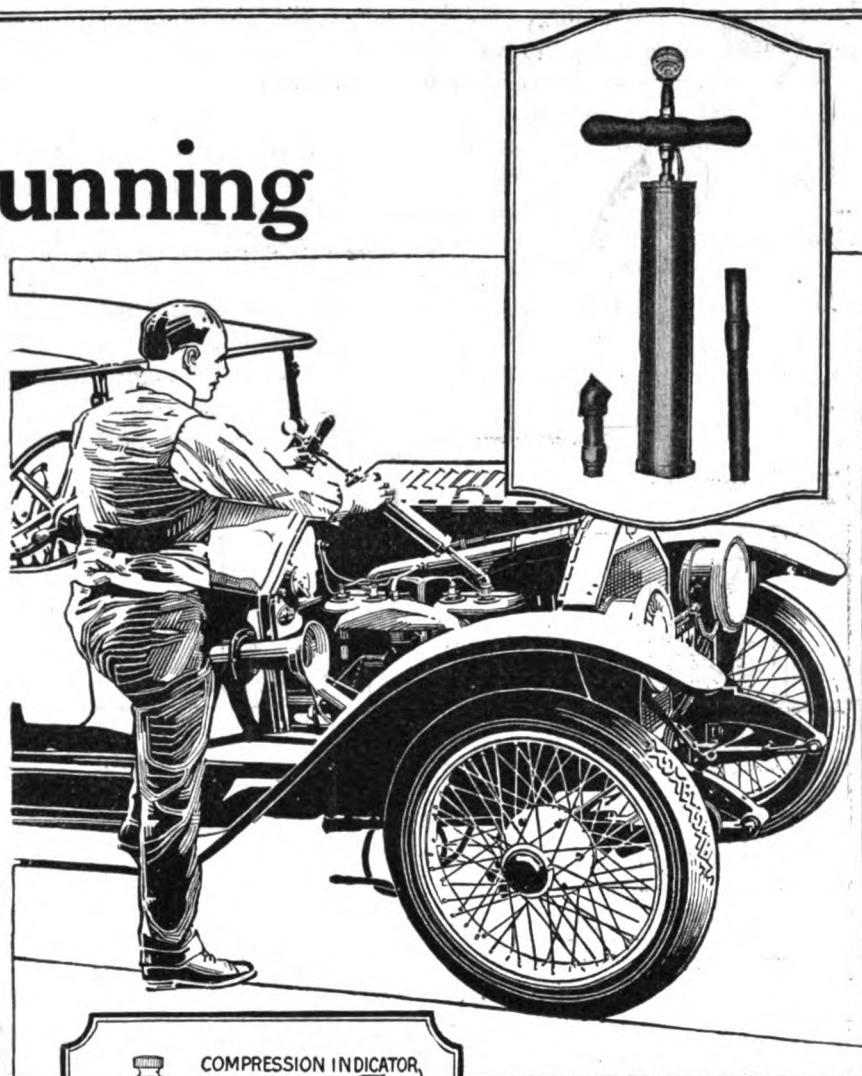
The Service Station Equipment Company.

The Hempy-Cooper Manufacturing Company.

The Peterson Engineering & Manufacturing Company.

The Groetken Pump Company,

and other manufacturers of garage equipment.



The Hempy-Cooper Tester and how it works. Price \$18.00 including fittings for 1/2 in. standard, 1/2 in. S. A. E. and Metric spark-plug holes. Fully protected by patents.



Company



TRUCKS & WHEELBARROWS - ENGINES & PUMPS - AUTOMOBILE & SERVICE STATION EQUIPMENT

ly a matter of keeping a pay roll. But the Federal income tax law of 1917 required, among other things, that all employers report to the treasury department at a stated time the names, occupations and respective earnings of those of their employees whose rates of wage exceeded \$800 a year. And straightway pay-roll accounting became a consideration of prime importance in the business world. Employers found their accounting departments swamped with the work of

In the Peterson plan of bookkeeping, wages paid are recorded in a loose-leaf ledger having a separate card for the account of each employee. The total paid is carried progressively from pay day to pay day. At the end of the year it is necessary only to glance at the last item on the card to know the exact amount of wages paid to the employee during the twelve months past.

But a stock ledger, an employees' wage ledger, or even an accounts receivable ledger would be of little value to the Peterson company unless each was kept posted up to date. And posting all these by the pen-and-ink method, as

Loose-leaf ledger forms for the four ledgers are of uniform size and arrangement.

With each entry in any of the four ledgers, the Burroughs machine prints the date and reference number, automatically adds the debit or subtracts the credits, posts either debit or credit in its proper column, and computes and prints the new balance. Every ledger page is simple in its arrangement, neat, and always legible. Every computation is dependably accurate.

A separate note account is worthy of special mention. When a customer gives his note on account, the transaction is entered as a credit in the accounts receivable ledger. The note account, carried on a separate ledger sheet to be filed with the cor-

responding account receivable, records the due date and shows the amount added as a debit. When the note is paid the amount is subtracted as a credit. Thus note account, without interfering with other records, shows a perpetual balance of

-See NOTE ACCOUNT-

Name P. H. MacDonald,
7 Grove Street

Rating

Card No. 1

Limit

Acct. No. 22

| FOLIO | DATE | MEMO | DEBIT | CREDIT | PREVIOUS BALANCE | BALANCE |
|-------|--------|------|-------|--------|------------------|---------|
| 11 | JAN 2 | | 1.50 | | 25.00 | 25.00 |
| 35 | JAN 7 | | 75.00 | | 26.50 | 101.50 |
| 37 | JAN 17 | | 7.50 | | 101.50 | 109.00 |
| 37 | JAN 23 | | 1.21 | | 109.00 | 110.21 |
| 140 | FEB 13 | | | 109.00 | 110.21 | 1.21 |
| 127 | FEB 15 | | 70.00 | | 1.21 | 68.71 |
| 230 | FEB 26 | | 6.50 | | 68.71 | 75.21 |
| | | | | 50.00 | 75.21 | 25.21 |

STATEMENT

TELEPHONE 6940

March 1, 1918.

P. H. MacDonald,
7 Grove Street,

AMOUNT \$ 2521*

WHEN PAYING BY CHECK AND NO OTHER RECEIPT IS REQUIRED, PLEASE DETACH THIS PART OF STATEMENT AND MAIL WITH CHECK. OUR ENDORSEMENT ON YOUR CHECK WILL CONSTITUTE RECEIPT.

PAID

DATE CHECK NO.

JAN 28 1.21

FEB 28 70.00

FEB 26 6.50

77.71 \$

C R

FEB 13 C/N 25.00 -

FEB 26 C/N 50.00 -

BAL 25.21 \$

THE SKY COVERS THE EARTH - SO DOES THE FORD

NOTE ACCOUNT

Name P. H. MacDonald,
7 Grove Street,

Rating

Card No.

Limit

Acct. No. 2

| FOLIO | DATE | MEMO | AMOUNT NOTE | CREDIT | PREVIOUS BALANCE | BALANCE |
|-------|-------|------|-------------|--------|------------------|---------|
| 10 | JAN 3 | | 135.00 | | | 135.00 |
| 77 | JAN 4 | C/N | | 135.00 | 135.00 | .00 |
| 2 | MAY 2 | | 109.00 | | | 109.00 |



Here Are Shown on a Reduced Scale the Peterson Motor Company's Accounts Receivable, Note Account, and Statement Forms.

tracing employees' names and numbers through mazes of records for many pay-periods to draw off the totals required for the tax return.

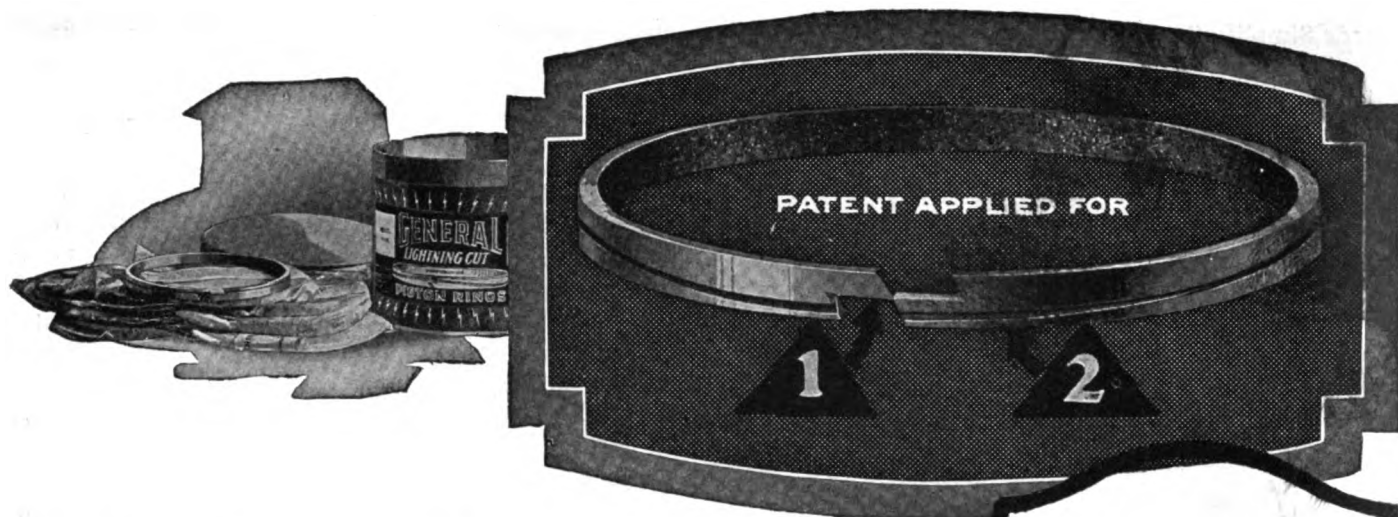
But, because it had anticipated demand, the Peterson Motor Co. encountered no difficulty in compiling a return for its employees. Making up the Peterson return was merely a matter of copying amounts from ledger cards—one amount for each employee.

Peterson has learned from experience in business, would constitute a burden of work beyond the capacity of the garage accounting department.

A Burroughs ledger posting and statement machine posts the Peterson books—gives a daily balance of every account in the stock ledger, keeps a progressive total of wages paid to every employ, balances—daily—accounts receivable—and at the end of the month makes out all statements.

the "paper" of every customer so carried.

In the making of statements the Burroughs machine prints, dates and adds each debit for the month and gives a sub-total of charges; prints dates and subtracts each credit, and computes and prints the month-end balance. Statements go out on the first of the month. Peterson knows that his statements are correct and that the early statement gets the money.



This Groove Gives Real "Stop" and "Go" Signals to Oil!

A GROOVE sweeps up and up around the Lightning Cut Ring. Oil gets just where lubrication experts say it should. It pulls the teeth of friction between piston ring and cylinder wall. On the down stroke, its straight edge effectually scrapes away all excess oil; returns it to the crank case.

With its combination of the old diagonal and step cuts, Lightning Cut Rings prove their superiority. Expansion may part the step cut but compression cannot pass. The broad edges of the diagonal cuts maintain a creeping, tenacious contact with their opposite walls and hold the power that moves the pistons.

GENERAL LIGHTNING CUT PISTON RINGS

From the individual casting is produced that fine grain, evenness of tensile strength and "springy" tension that distinguishes the Lightning Cut Ring from those sliced from pot castings. The scale left on the inside makes for uniform expansion.

Wear on cylinder walls caused by unequal ring pressure is conspicuous because of its absence. Lightning Cut Rings are of full concentric design.

Lightning Cut Rings are of one piece construction—unit expansion—unit strength and unit simplicity. They are made of finest gray iron, and are thoroughly tested and guaranteed.

With the extra power that Lightning Cut Rings afford the car owner he gets more mileage. With

less oil he gets less carbon. With less friction, less wear. Be ready to sell or equip him.

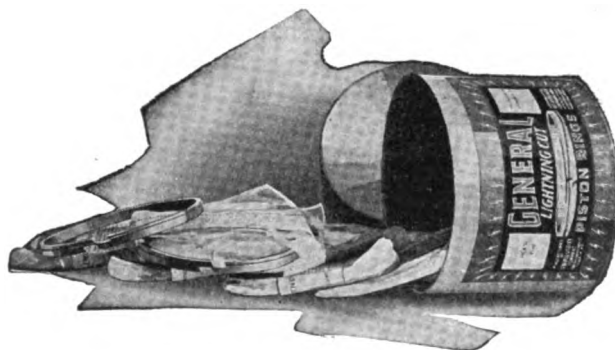
Made in all sizes. Packed in oil proof envelopes. Neatly boxed. One dozen to the carton. Cartons are attractively labelled and make a handsome display.

Our new selling plan revolutionizes the marketing of piston rings. Fall in line with other progressives and write for details. It's a money maker.

1. The Lightning Cut.
2. Oil Distributing Groove.

Left: Shows shape of oil groove. Note scraping edge.

Bottom: Shows upward course of oil groove.



UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

Factory 1324 Ogden St. Philadelphia - Office 809 New Stock Exchange Bldg., Philadelphia

Utilities that Sell Because They Serve

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Records Simplify Tire Adjustments.

(Concluded from page 15.)

we don't bother. Our record on tires includes: Serial number, day received, day sold, and to whom; also speedometer readings.

"Well, I heard the plaintive cry for help and referred to the book and found that this tire was a Norwalk

He was Campaign Director for the Boston district in the Fourth Loan and it was this loan to which the members of the automotive trade subscribed their record amount.

Mr. Coe was chairman of the New England Automobile Board of Trade which later was merged with the N. A. D. A. He organized and directed its campaign for membership. For some time he was Chevrolet branch manager at Boston which he resigned to enter war work. He became program director of the U. S. and allied Governments Bureau of Expositions. At Waco, Texas, Mr. Coe arranged an opening celebration for the War Exposition in connection with the Texas Cotton Palace which witnessed the shattering of at least one world's record as exactly 148 aeroplanes took the air at one time and sustained feature flights over the city for two hours without mishap.

The new field secretary is a gifted speaker and did excellent work all over the southwest in addressing large audiences on the Government War program and expositions. He has also done a great amount of speaking on sales and sales organization and is considered an expert on advanced selling and publicity methods. Dealers and owners alike have confidence in his judgment and experience. His experience as branch manager and general sales manager for two different companies enables him to see a problem from the point of both dealer and manufacturer.

"I became identified with the N. A. D. A. simply because it represents all that I feel the automobile dealer must have," said Mr. Coe regarding his new connection. "Many organizations in a similar position would entirely miss the real value of their existence. The officials of the organization realize that the interests of dealer, manufacturer, and owner are identical in the last analysis, and for this reason if no other, the work of the association will benefit all the classes identified with the industry. A glance at the tremendous good already accomplished is sufficient evidence of the future of the work. A great part of successful selling is successful selection of the thing to be sold."

Poisoning from Exhaust Fumes in Garage During Winter.

Prevention of poisoning from exhaust fumes is reported to be the most recent health problem confronting physicians, according to the director of the department of health of Philadelphia. The tremendous increase in the use of automobiles and the proportionate demand for garages is said to be responsible for the creation of the problem.

"While few cases are on record," says the director, "of gas poisoning known as petromortis, it is anticipated that the fall and winter months may bring to light cases of gas poisoning caused by inattention to proper ventilation required in the garages.

"A large public garage as a rule is safer than the private garage because in the former there are always means for escape of partly combusted gases and volatile by-products which arise during the operation of gasoline engines." Where the repair shop is separated from the garage, care should be taken to see that it is properly ventilated.

The poisoning is said to be manifested by headaches, dizziness, and a feeling of nausea which soon disappears. The most serious part of this type of poisoning is that death may be caused in a short time without due warning.

Carriages as Well as Clothing Reflect Progress of Style

It is seen throughout the pages of history that carriages as well as clothing have reflected man's yearning for style.

From Egypt and India we have the jeweled trappings of the camel and the gem-incrusted howdah. In English history frequent mention is made of the stately and cumbersome family coach of the aristocracy, and from "sunny" France we get the name, at least, of the coupe and sedan from the days of the luxury-loving court of Louis XIV.

Good taste and the mode rule design at all times. So today we find automobile manufacturers and workmen striving to construct cars which will include not only the appearance of extreme care and beauty, but a touch of elegance as well.



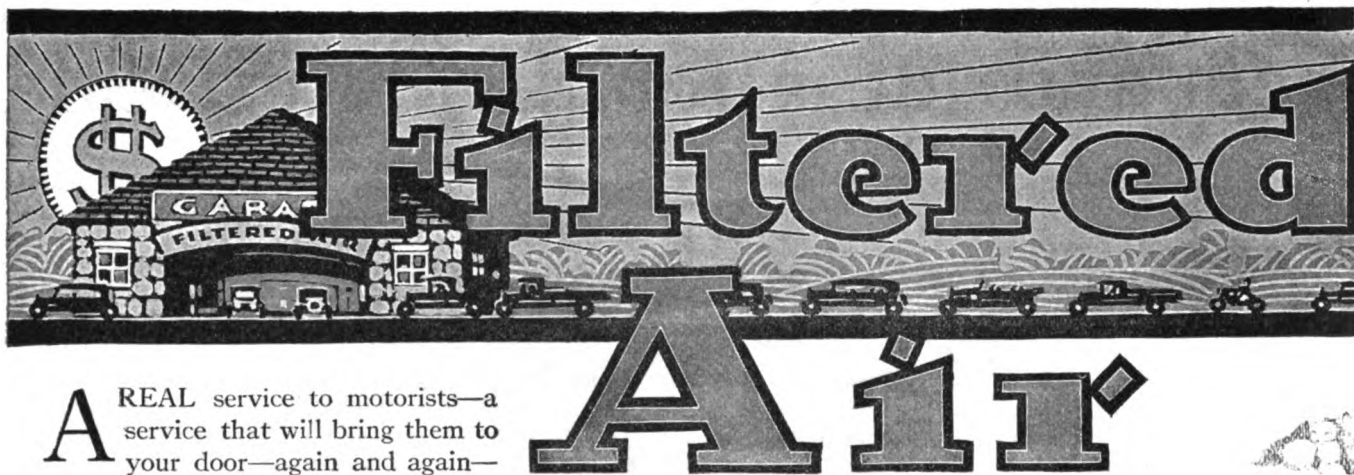
Ester Ellerbeck, Office Manager of The Guarantee Tire & Rubber Co.

non-skid 32x4 fabric tire which sold June 27, 1917; brought in on January 15, 1918, to have a puncture repaired; that said tire had been run the last mile flat and was in bad shape at that time; that it was still running in August, 1919, at the time an adjustment was asked for.

"Did he get that adjustment gratis? He did not. The record book showed he was working under the dark shadow of the statute of limitations with quicksands on either side the narrow bitulithic roadway. That record's value as a money maker and saver is growing this fourth year of its existence by leaps and bounds. No trouble to keep it now since it proved its value."

Coe Is Eastern Field Secretary of National Dealers Body.

Charles F. Coe of Boston has been appointed Eastern field secretary of the National Automobile Dealers' Association. He is well known to the trade throughout New England and the northwest, having gained prominence in trade organization work.



A REAL service to motorists—a service that will bring them to your door—again and again—that will keep them your customers—that will build the utmost good-will for your business. That's what "FILTERED AIR" will mean. It will increase your business surprisingly. A "FILTERED AIR" sign above your door will keep you in constant touch with all classes of motorists, creating an obligation on their part to become your customers.

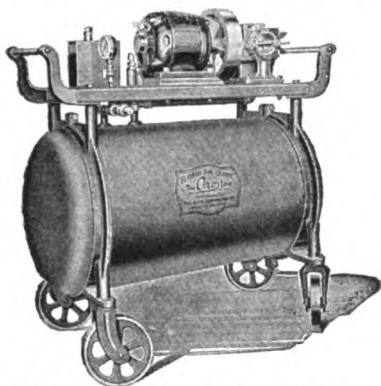
The No. 7 AU-TO AIR COMPRESSOR furnishes an abundance of perfectly filtered air. A special liquid takes out absolutely all dust and oil—the two worst enemies of tires. The air comes from the tank as pure and clean as from a mountain top.

This is a complete outfit in itself: motor, piping, valves, gauge, automatic unloader, automatic switch

Ask your jobber, or write us, sending his name, if he cannot supply you. Now is the time to get this excellent business builder!

THE AU-TO COMPRESSOR CO.

304 S. Mulberry Street WILMINGTON, OHIO

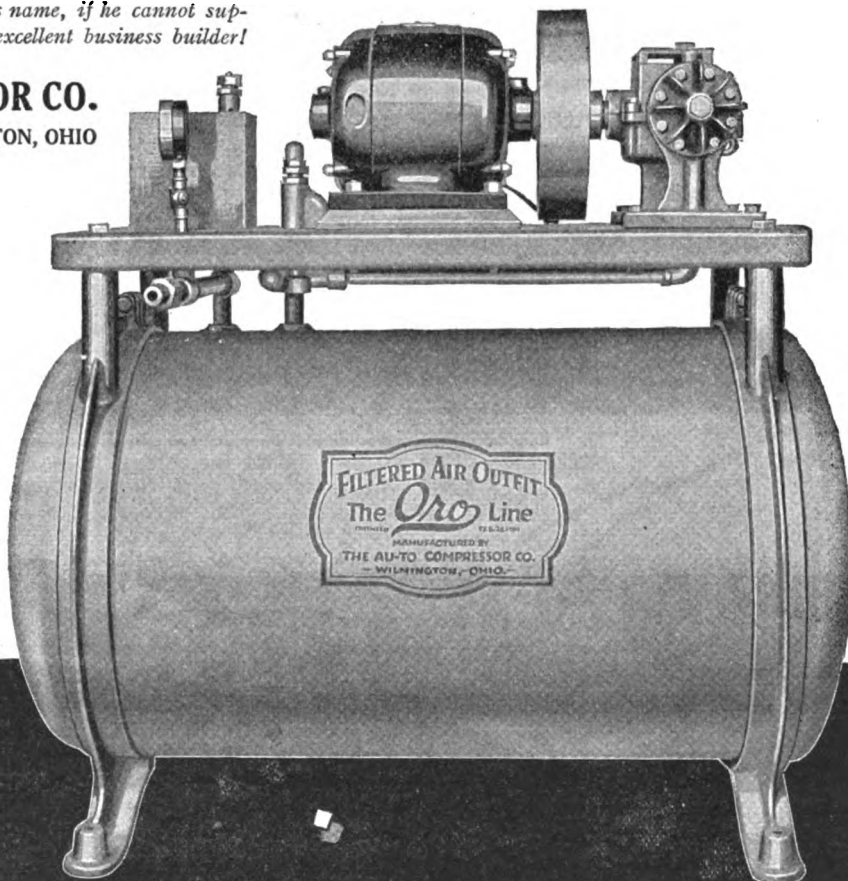


Model No. 8 Au-To Air Compressor—same as No. 7, excepting that it has large wheel casters, which make it easy to move from place to place in the shop or garage.

and tank—assembled and ready to run. The motor is only $\frac{1}{2}$ horse power. This outfit requires no watching, no tinkering—the tank is kept full of filtered air, ready for motorists—day and night. This outfit furnishes a regular working pressure sufficient to handle the largest pneumatic truck tires.

Only 3 Moving Parts!

In addition to the valves there are only 3 moving parts to the compressor mechanism. Such astonishing simplicity must mean durability and continuous satisfactory service. Of course, our regular guarantee of perfect service goes with this machine.



a sign like this



brings business.

Facts and Ideas for the Tire Dealer

Are Pneumatic Tires Better Than Solid Tires on Trucks?

At the Truck Owners' Conference held in Chicago, September 25 and 26, an interesting debate was conducted on the relative worth of "Pneumatics versus Solid Tires." Briefly, the conditions as stated were: A corporation has been formed for the purpose of doing general merchandise hauling within a radius of 15 miles of the Chicago City Hall. It operates either on the basis of contract, day or ton-mile.

The company has purchased three new 2-ton trucks and estimates operating these 270 days in a year, in that time covering about 10,000 miles. The question arose as to whether these trucks should be equipped with pneumatic tires or solid tires.

Two teams of debaters were picked from users of pneumatic and solid tires. They were men who have had practical experience with both kinds of tires. Three well-known truck users, after they had affirmed that they were not prejudiced one way or the other and were open to conviction, were appointed by the chairman to act as judges.

The members of the pneumatic-tire team stated the following arguments in favor of pneumatic tires: A 1½-ton truck four years old equipped with pneumatic tires showed a 40 per cent. decrease of operating cost, covered more ground, and saved considerable time due to an increase of speed; the decrease in gasoline consumption amounted to 15 per cent., the long trips were less tiring on the driver, and it was safer hauling destructible merchandise. They further stated that four trucks in the same mechanical condition were equipped with new tires, two with pneumatics and two with solid tires.

At the end of ten months, one solid-tired truck had traveled 9,500 miles at an expense of 20½ cents a mile and a gasoline consumption of 4.8 miles per gallon. One of the pneumatic-tired trucks, in the same time, had traveled 16,600 miles at an expense of 10 cents a mile and a gasoline consumption of 8.75 miles per gallon. The repair and maintenance expenses were decreased 50 per cent., and of this 50 per cent., 75 per cent. was for engine repairs.

Then one of the members of the pneumatic team went on to say that air was very resilient and compared the effect of pneumatic tires on the roadway with an airplane skimming through the air. He

also claimed that trucks equipped with solid tires show a greater wear on the bearings and bushings, and that the rivets on the framework loosen in a very short time; besides, that pneumatics have better traction and therefore no chains are needed.

The members of the solid-tire team gave their arguments in favor of solid tires by refuting the statements made by the advocates of pneumatics. Makers of pneu-

lessness and trouble; at the same time, this increase of speed is in direct violation of the State Law which allows a maximum speed of 18 miles per hour for a 1-ton truck, 16 miles per hour for a 2-ton truck, and 15 miles per hour for a 3-ton truck.

The makers of pneumatic tires claim a decrease in road depreciation as an argument in favor of pneumatic tires. Results of research work, for which Germany spent \$200,000, show that the suction effect of pneumatic tires causes a more rapid wear of the road surface and creates more dust than solid tires. Greater traction for pneumatic tires is also claimed. Tests, however, show that a 2-ton truck equipped with solid tires and traveling at a speed of 15 miles per hour will stop in a shorter distance than a 2-ton truck equipped with pneumatic tires and traveling at the same speed.

The manufacturers of pneumatic tires claim that the damage to merchandise is negligible when trucks are equipped with pneumatic tires. Trucks equipped with pneumatic tires have a greater rebound, which causes the load to shift and results in breakage and damage due to abrasion.

The greater mileage range is another advantage stated in favor of pneumatic tires. A survey of motor truck transportation problems brings to light the fact that a 2-ton truck equipped with solid tires meets the average requirements of transportation.

The members of the solid-tire team claimed that the difference in price between pneumatic and solid tires was again as great as the cost of repairs, and consequently the use of pneumatics would not lower the cost of repairs, and that further-

more the expense of repairs to the truck and the damages to merchandise were directly proportional to the driver's carelessness and that this personal factor was the same whether a truck was equipped with solid or pneumatic tires.

The speakers for the pneumatic team refuted the argument that the depreciation of roads is greater with pneumatics by saying that it was true of macadam and gravel roads, but not for concrete roads. They further contended that the damage to merchandise, if properly secured, was not from rebound, but from the direct shock transmitted through solid tires.

One of the speakers for the pneumatic-

WHAT IS YOUR EXPERIENCE?

The arguments here presented in favor of pneumatics or solid tires are those of men who have had considerable experience in the transportation field. They are men who either own or are in charge of large truck fleets and who have tried both pneumatic and solid tires.

We in no way vouch for the statements made by the members of the debating teams. We have simply stated the arguments as presented, without in any way changing them to embrace our own convictions. We hope that the facts brought out by this discussion will be a help to the manufacturers of pneumatic tires in answering the many questions which truck owners ask concerning the various points brought out by the debaters.

The success or failure of convincing anyone of the advantage of pneumatic tires depends mostly on the person who is endeavoring to do this. Consequently the decision in favor of solid tires may not be the result of clear-cut statements and irrefutable arguments, but of a rhetorical appeal based on the specific rather than on the general experience of truck owners. The pneumatic tire for truck uses is new, its advantages are not known to many, and like anything outside of the everyday, has to be explained to the average person.

Perhaps you have had some experience with trucks equipped with pneumatic tires. You, Mr. Dealer, have probably sold trucks equipped with pneumatic tires which have given unusual service and have decreased gasoline and repair bills. Write to us and tell us your experience.

matic tires claim decreased depreciation for trucks equipped with their type of tires.

This, members of the solid-tire team claimed, was not so, because the engine constitutes the greatest percentage of truck depreciation, and it makes no difference whether a truck is equipped with solid or pneumatics, the engine vibration is the same. The pneumatic-tired trucks are subject to a side-sway when traveling over rough roads and this effect on chassis depreciation is equal to the effect of increased vibration due to solid tires.

The increased speed available when pneumatic tires are used results in care-

Each lamp complete with 20-foot cord and fittings (except bulb) as illustrated

The cord's the thing on an extension lamp

IT is the part which carries the electric current, which when worn through immediately becomes a fire hazard and a source of accident. It should therefore be the strongest part of an extension lamp. This is the case with the

DURACORD EXTENSION LAMP

This lamp is all wired up ready for use with genuine Duracord, the cord that was made expressly for hard service. It will outwear ordinary cords four to six times.

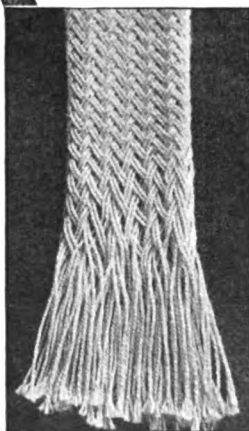
Duracord has none of the dangers of steel-armored cable, such as the metal cutting through to the wires, nor will it scratch polished surfaces.

It is gripped in the handle by a patented "holdfast" fitting that prevents it pulling out even under excessive strain.

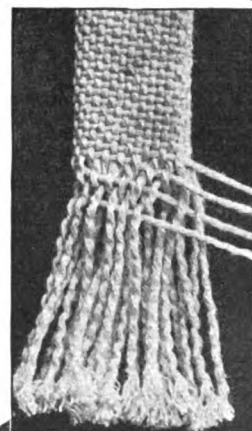
Each lamp complete, packed in an individual box. Prices:

| | |
|-------------------------------|-----|
| Light weight | \$5 |
| Heavy duty (as illustrated) . | 6 |
| Vapor proof | 8 |

TUBULAR WOVEN FABRIC CO.
Pawtucket, R. I.



Here is the ordinary braided cable covering. Note the open and porous construction, easily cut, stretched or unraveled. Compare it with Duracord.



This is Duracord. Thick, heavy strands, woven like a piece of fire hose, not braided. Picture shows outside covering only with impregnating compound removed.

It PAYS to be a

THE advertising publications are printing long articles telling about the bold, unique and sensible advertising campaign of the Mutual Truck Company.

\$60,000 in BUSINESS papers and several times that amount in local newspapers

Our double-page campaign in TRADE JOURNALS (see miniature reproduction) talks straight business to a MILLION BIG BUSINESS MEN, in their own offices, in papers that they look to for advice in buying all their plant equipment; for a Motor Truck is a piece of plant equipment and is bought as such.

~ ~

Who are your best "prospects" for a high-quality, heavy-haulage Truck? Aren't they the big manufacturers and wholesalers in your territory?

And the professional Teaming Companies? And the Farmers, Stockraisers, Grain and Produce Men?

These are the men—the big men—that we talk to week-by-week and month-by-month, thru their "Business Bibles," and the way their inquiries are coming in proves that they are deeply interested in what we have to say about

"America's Greatest Truck"

They are the sort of men who want the very best and have the money to pay for what they buy.

When you become our agent, you will find that we have already created the demand among the Captains of Industry and Trade in your territory.

This campaign uses the 65 leading Trade Papers in the following industries:

Heavy-Haulage Industries Reached by this Campaign

Brick and Clay Products
Building Materials
Candy Manufacturers
Cement and Concrete
City Officials
Coal—Wholesale and Retail
Contractors and Engineers
Chemical Industries
Creameries and Dairies
Department Stores
Electric Light Companies
Express Companies
Farmers
Fleet Owners
Flour and Feed Stores
Flour Mills
Foundries
Furniture Mfrs. and Dealers
Fruit Shippers
Gas Companies
Grain Dealers
Hides and Leather
Highway Commissioners
Ice Cream Manufacturers
Implement Manufacturers
Iron and Steel Manufacturers
Iron and Steel Jobbers
Iron and Steel using Industries
Lumber Dealers
Lumber Mills
Machine Shops
Machinery Manufacturers

Men's Clothing Manufacturers
Milk Companies
Mill Supply Houses
Mining Co.'s—Coal and Metal
Newspapers and Publishers
Oil Companies
Oil Jobbers
Paint Mfrs. and Jobbers
Packers
Petroleum Refiners
Piano Dealers and Movers
Potteries
Produce Jobbers
Road Builders
Scrap Iron Dealers
Ship Builders
Ship Chandlers
Shoe Mfrs. and Wholesalers
Stock Raisers
Sugar Mills
Tanneries
Teaming Companies
Telephone Companies
Textile Industries
Threshermen
Timbermen
Traffic Managers
Water Works Superintendents
Wholesale Houses
Women's Clothing Mfrs.
Wood Working Industries

"America's Greatest

OUR campaign also includes general business papers for Executives—such as System, Industrial Management, National Banker, Purchasing Agent, Etc. And this list is being added to, week-by-week.



SULLIVAN COUNTY
INDIANA

MUTUAL
"America's"

An "All Star" Truck

Like an "All-Star" theatrical performance, the MUTUAL TRUCK is an aggregation of units that have won a place and a name for themselves at the very top of the profession.

In making our selection of the units for the MUTUAL we closed our ears to the noise of mere popular advertising; and, by careful comparison, measurement and test, of the rival makes of engines, clutches, transmissions, universal frames, axles, radiators, steering gears, magneto, carburetors, wheels and all other parts, chose the ones that the great majority of the best posted authorities on the "inside" agreed with us were the very ones that could be used for a truck that would dare call it all—"America's Greatest Truck."

MUTUAL SUPER SPECIFICATIONS (TWO TON)

America's Greatest Truck Engine
From every standpoint—design, material, construction, extreme care in manufacture and inspection, the Wisconsin Engine is recognized as indisputably America's Greatest Truck Engine.

There are several very good "second best" truck engines on the market, any one of which is good enough for an ordinary truck; but there is only one engine that is good enough for "America's Greatest Truck"—and that engine is the "Wisconsin"—first in gas economy, endurance, reliability and all-around engine efficiency.

And we put into our 2-ton MUTUALs the same 4 x 6 Wisconsin engine that others use in their 3 and 3½-ton trucks.

America's Greatest Truck Governor
The Duplex Company's Duplex (not Simplex) is the only one that controls road-speed independent of motor-speed. It makes the driver obey the owner's orders always and everywhere. It is, in fact, an "automatic chaperon" that adds years of life to the machine by guarding it against abuse. It is vastly more accurate than throttle control; makes a 20% increase in gasoline efficiency by use of a patented "grid" valve instead of the hither-to type. Its provisions had led to suit road conditions, delivers power as needed, and insures quick get-away. The Duplex delivers more power on hills and bad roads; increases average road speed 20-30%; and adds an automatic safety brake on steep down grades. Incidentally it costs us 2 to 5 times as much as other makes and types.

America's Greatest Truck Clutch
The Holts Shaw, Universal No. 5, oil-immersed, multi-plate clutch costs us twice as much as the next best, and from three to four times as much as clutches used on the majority of trucks. It gives a smooth, silent but positive pickup; a firm, fast grip; and saves the engine and entire mechanism (including tires) the ruinous "racking" that cheap clutches cause. You will tolerate no other clutch on any truck you own after you see the Holts Shaw.

\$300,000 in Local Newspapers

The minute our sales contract is closed with you, we begin a whirlwind local newspaper campaign over your signature, in your own leading newspapers, giving them \$300,000 for the first 1000 trucks we build—a campaign that will make so big a "noise" that Mutual Dealers will soon dominate the whole high-class truck business for their territories.

Backed By a Whole Rich County

Back of the Mutual Truck Company stands the citizenship and the wealth of Sullivan County, Indiana—a county famous for its rich farms, its pedigreed live stock, its 50 operating coal mines, its oil wells, its natural gas, its 14 prosperous Banks and for its HUSTLE. For this is essentially a community enterprise, backed by the wealth and the earnest purpose of a great wealthy county; and our 500 stockholders can command more millions than we shall ever need, to realize their underlying ambition to make Sullivan the home of America's Greatest Truck Company.

MUTUAL Dealer

Truck"—2—3½—5—ton

WE reproduce below, a photograph in miniature of one of the big double page "spreads" that we are running in weekly and monthly Business Papers reaching hundreds of thousands of proprietors and executives of America's heavy-haulage industries.



MUTUAL
Greatest Truck 2-3½-5 TON

America's Greatest Truck Universal

Could it be anything but a Spicer? And we use three Spicer joints in the shaft and a fourth in the universal clutch itself. Here, too, we put into our 2-ton Mutual a size wheel for 3 and 3½-ton trucks by all other makers who use the Spicer.

America's Greatest Truck Transmission

"Fuller" of course; and their model "G5" selective; with removable plates, to permit attachment of mechanical joint and tire pump. Four speeds forward and reverse. A simple sturdy, dependable gear-set used by leading high-speed truck makers on their 3 and 3½-ton models.



America's Greatest Truck Axles
(Ball Bearings)

To insure the highest efficiency, we adopted the Sheldon Worm Gear Axle—first because both the worm thrust and radial loads are taken by ball bearings, which offer less friction than any other type of bearing. Second—because it is of the semi-floating type, which has the advantages of greater simplicity, less weight, greater carrying capacity, greater resistance to side shocks, lower maintenance cost and greater ease of removing wheels for inspection. The more deeply versed in scientific automotive engineering a man is, the more emphatic will be his declaration that the Sheldon is America's Greatest Truck Axle.

Sheldon Ball bearing steering knuckle type of Front Axle was adopted as a matter of course.

And These, Too, Are Greatest:

Parish and Bingham pressed steel Frame, extra heavy type. Length 224 inches.

Mather Chrome Vanadium Springs.

Smith Metal Wheels for solid tires—regular equipment and not a costly extra.

Dayton Steel Wheels for pneumatic tires.

Goodyear or Firestone Tires; 36 x 4 solid for front wheels and 36 x 8 for rear; or same makes of pneumatic tires as an option, at an extra cost.

Ross Steering Gear—with 20 inch wheel (not 17-18 inch).

Perfex Radiator, worth a big story in itself.

Bosch Magneto—type ZR4 with impulse-starter. Dust proof and water proof.

Stromberg Carburetor; type M.

Bound Brook Oilless Bushings throughout.

Weather-tite Cab—fit for a king; regular equipment.

Powell Muffler—12 sections. Remarkably silent.

Electric Steel Castings at vital points, where others use malleables.

25-Gallon Gasoline Tank

Special 2½-gallon Reserve Lubricating Oil Tank. Wheel base—150 inch.

Specifications on the Mutual 3½-ton and 5-ton are equally "great."

Buy One "Mutual"

Don't nibble about the price; but take our word for it—on this one purchase—that we give more for the money, in actual cost to us, than you can get in any other truck.

Put your "MUTUAL" into the hardest service you have, and keep a record of its vanishing performance—all costs covered.

Do this, and all your future purchases will be MUTUALS.

We rise or fall on this test; and remember, we have every more at stake than you.

MUTUAL TRUCK COMPANY, SULLIVAN, INDIANA, U. S. A.

100 Dealers—10 Trucks Each

or their equivalent will be all that we can take care of between now and spring; so you will have to Act *Quickly* if you want to cash-in on the most effective truck advertising campaign ever staged; and to have the honor of being selected as the local representative of what is actually

America's Greatest Truck

Come to Sullivan

That's the best way; wire us that you are coming, then come. We are 26 miles due south of Terre Haute in S. W. Indiana, along the Illinois border—on the main line of the C. & E. I. and a "cross" line of the Illinois Central. Also reached by trolley every hour from Terre Haute. You will be our guest while in town—and we'll treat you "white." Before you leave us, you will know we are actually producing America's Greatest Truck, and will be "wild" to get back on the territory with a demonstrator. Telegraph you're coming—then come.

MUTUAL TRUCK COMPANY

Sullivan, Indiana, U. S. A.

Super-Specifications (2 ton)

Wisconsin Engine, four 4 inch cylinders, with 6 inch stroke; developing 36 horse power at 1000 r.p.m. A "3 ton" engine in a 2 ton truck, America's Greatest Truck Engine—in endurance, smooth running, reliability, gas economy.

Hele-Shaw Clutch, Universal No. 5, with multiple discs in oil bath. Costs us three or four times as much as clutches used on most trucks.

Duplex Governor, double control. (Not Simplex, single control) Governs both engine speed and road speed and adds years of life to the truck by preventing its abuse.

Sheldon Rear Axle, Ball bearing, semi-floating type. Less frictional resistance, greater simplicity, greater carrying capacity and lower maintenance cost than any other truck rear axle. We put their 2½ ton size (built for 20% overload) on our 2 ton Mutual—or the same that others use on their 3 ton trucks.

Spicer Universal. Three joints in shaft and the fourth in our universal clutch. We put same size of Spicer Universal into our 2 ton Mutual that you'll find in other 3 ton and 3½ tons trucks.

Fuller Transmission. "G5," selective—Four speeds forward and reverse. Most trucks offer only three speeds. We give you the same Fuller unit on our 2 ton Mutual that other truck makers put into their 3 and 3½ ton machines.

Parish & Bingham Pressed Steel Frame, extra heavy type. Length, 224 inches. Big enough for any 3 ton truck. Wheel base, 150 inches.

Mather Chrome Vanadium Springs, scientifically heat treated; unequalled for lightness, flexibility, endurance.

Smith Metal Wheels for solid tires—regular equipment and not a costly extra. We could buy best quality wood wheels at half the cost.

Dayton Steel Wheels for pneumatic tires.

Goodyear or Firestone Tires, 36x4 solid for front wheels and 36x8 for rear wheels, where other makers supply either 36x7 or 36x4 dual; at a much lower cost.

Westinghouse Starting and Lighting System; regular equipment.

Ross Steering Gear with 20 in. wheel (not 17 or 18 in.)

Perfex Radiator, cast tank type. Most efficient and longest-lived radiator ever built. Our special self-lubricating "floating" spring suspension absolutely insures radiator against road shocks.

Bosch Magneto—ZR4. Dust proof and water proof.

Stromberg Carburetor. Type M, insuring maximum power, low throttle, rapid acceleration, giving highest efficiency from low grade fuels now in use.

Bound Brook Oilless Bushings throughout.

"Weather-tite" Enclosed Cab—fit for a king; regular equipment. Other makers charge from \$150 to \$200 extra for this type of cab.

Powell Muffler with 12 sections, instead of 10 or less used on most other trucks.

Electric Steel Castings, at vital points, where others use malleables.

25 Gallon Gasoline Tank.

Special 2½ Gallon Reserve Lubricating Oil Tank. An unusually practical and valuable feature.

tire team disproved the statement that the increased cost of pneumatic tires over solid tires would more than cover the average repair expense and depreciation when solid tires are used, by stating the following cost figures: For a 2-ton pneumatic-tired truck the depreciation is \$300 a year as against \$440 on a solid-tired truck. The pneumatic-tired truck saves \$140 a year on repairs, \$100 on maintenance, and \$116 on gasoline, or a total saving of \$490. The difference in cost between pneumatic and solid tires amounts to \$405, therefore the net saving when pneumatic tires are used amounts to \$91. These figures, the speaker stated, were very conservative and could easily be doubled.

He also refuted the contention of low tire mileage for pneumatic tires by stating that the government on rural service obtains as high as 16,000 miles per tire.

The debaters on the solid-tire team disproved the argument that pneumatics save gasoline and maintenance expense, saying that figures computed both for a solid-tired and pneumatic-tired truck show that the former costs 17 cents per mile, of which 2.7 cents is for gasoline, while the latter costs 23 cents per mile, of which 3.5 cents is for gasoline.

They also stated that the average mileage of solid tires is about 13,000 miles, while that of pneumatics is only 9,000, and the large pumps necessary to obtain the required pressure in pneumatic tires are not very handy and at present cannot be made a part of the truck equipment. The argument of increased truck speed was also refuted by the statement that doubling the speed of the truck quadruples the force of the shock and this means greater damage and increased repair expense, besides being in direct violation of the state law.

After the allotted time for the debate had expired, the chairman asked the judges to retire to the ante-chamber and decide on the winning team. While the judges were in deliberation, the chairman asked truck owners to offer arguments in favor of either the solid or the pneumatic tires or simply to state their experience with one or the other. The consensus of experience was in favor of solid tires.

In the meantime, the judges had returned and after listening to some of the discussions, which, however, in no way influenced their decision, stated through the chairman that the three trucks which are to be used for the transportation of merchandise in Chicago should be equipped with solid tires.

Rotation of Tires Will Result in Greater Mileage.

In order to obtain the maximum mileage from tires, experts advise that new tires be put on the rear wheels, and the old ones moved to the front wheels. This

principle of tire rotation will increase tire mileage as much as 50 per cent. The service which tires are called upon to give on front wheels is less severe than that required on rear wheels. Tires which are nearly worn out on the rear wheels will run for many miles under less severe conditions on front wheels.

There may be some objection to this practice of tire rotation from persons using non-skid tires who claim that they cause difficult steering when on the front wheels. This objection to the use of non-skid tires on front wheels is confined to tires with small, sharp projections. The non-skids with a broad, flat traction surface can be used on front wheels just as satisfactorily as on the rear.

Improper Care of Cord Tires Cause of 40 Per Cent. of Replacements.

According to an expert of one of the large tire companies, fully 40 per cent. of tires sold in that company's service stations in the last few months have been sold to replace tires that went out of commission because of improper care and neglect.

"Because of the larger air capacity of cord tires and their flexibility, we have advocated inflation pressures for cord tires which are 10 per cent. lower than for fabric tires," he says. "But motorists, encouraged by the good service received, have reduced our inflation schedule. A recent investigation showed that many cord tire users were carrying only about half the recommended air pressure.

"The use of cord tires is increasing and will continue to increase, but sufficient attention must be paid to the maintenance of proper air pressures. The layers of rubber between the plies of cords are so heavy that the tires will hold up under a tremendous amount of punishment—but they have a limit, and when that limit is reached the motorist pays for his experience with mileage that is lopped off his tires."

Inflation Schedule Adopted by Soc. of Automotive Eng.

Despite the stress placed by tire manufacturers on the importance of proper tire inflation, from the standpoint of long mileage, the majority of tire users continue very careless in this respect, according to F. C. Milhoff, general sales manager of the Miller Rubber Co., Akron, Ohio.

"Tire users," says Mr. Milhoff, "don't seem to realize that under-inflation and sometimes over-inflation are more injurious to tires than bad roads, careless driving and other handicaps that beset the average tire.

"Inflation trouble is so unnecessary that one cannot ignore the terrific abuse that pneumatic tires undergo in this respect. Manufacturers and dealers spend

a great deal of money for literature that will show the motorist the proper inflation required for his tires, but only a few of them profit thereby.

"While it is true that the proper degree of carrying capacity and inflation may vary slightly with different makes of tires, a standard scale carefully arrived at could be used to advantage by all motorists. One of the best general scales for capacity and inflation is that recently adopted by the tire and rim division of the Society of Automotive Engineers." The scale is as follows:

Fabric Tires.

| Tire Size. | Maximum Load Per Tire. | Corresponding Air Pressure. |
|------------|------------------------|-----------------------------|
| 3 | 375 | 45 |
| 3½ | 570 | 55 |
| 4 | 815 | 65 |
| 4½ | 1,100 | 75 |
| 5 | 1,500 | 85 |

Cord Tires.

| Tire Size. | Maximum Load Per Tire. | Corresponding Air Pressure. |
|------------|------------------------|-----------------------------|
| 3 | 400 | 40 |
| 3½ | 600 | 50 |
| 4 | 850 | 60 |
| 4½ | 1,200 | 70 |
| 5 | 1,700 | 80 |

Wheel Construction with Greater Resiliency on Market.

A new type of wheel construction which is said to possess great resiliency is presented by the Jaxon Steel Products Co. This wheel is said to contain no springs and no working parts. On trucks equipped with them the axle is "floated" on a series of rubber cushions which radiate from the hub, distributing the pressure in all directions. There is no contact between the hub and the tire except through the cushions.

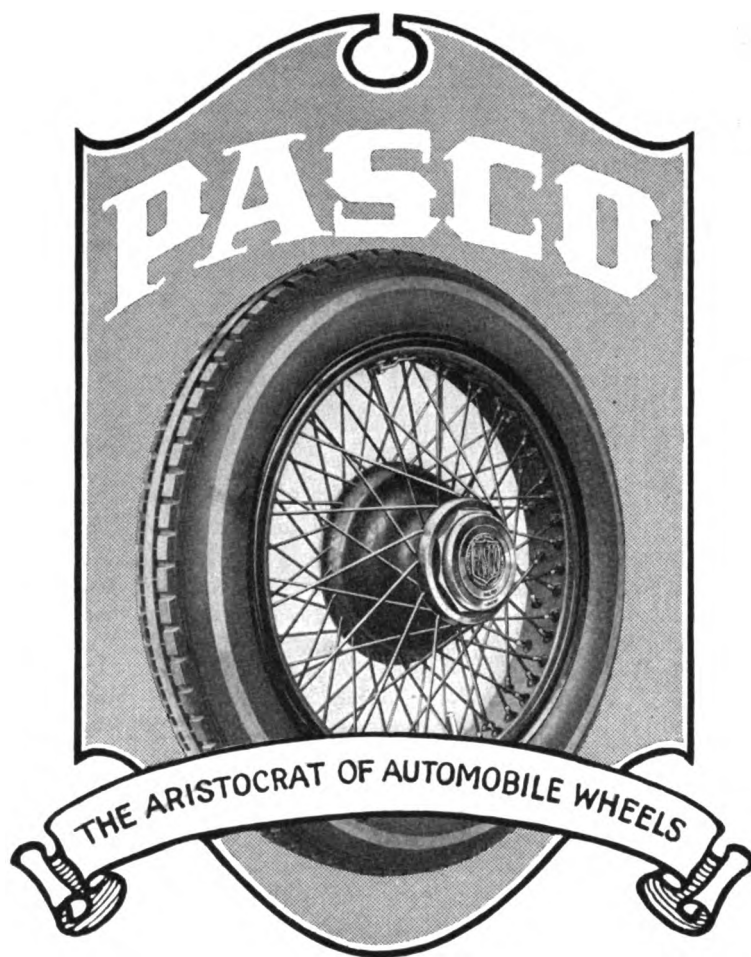
The cushions above and at the sides of the hub bear the weight and shocks equally with those underneath. These cushions are held in a steel framework which is riveted to the steel felloe band. The felloe band is made according to S. A. E. dimensions so that any standard make of solid rubber tire can be used.

There are no moving parts within the wheel and no motion except that given by the resiliency of the cushions, the upper halves of which act as shock absorbers and practically neutralize the recoil.

The ability to absorb shocks is due to the ample volume of rubber which is exposed to the strains, and to the support which is given to each cushion throughout its entire circumference so that strains may be uniformly distributed.

The Jaxon wheel is said to absorb torque shocks by offering resiliency between the axle and tire, allowing a rotary lag to occur between the center and outside portions of the driving mechanism, relieving the sudden strains on the driving gears and the mechanism.

BEAUTY *and* STRENGTH



ALTHOUGH the large Pasco distribution is due mainly to the distinguished touch of refinement and fleetness Pascos impart to the automobile, the owner mechanically inclined does not lose sight of the exclusive features that provide the exceptional Pasco strength, safety, economy and convenience.

In addition to Pasco beauty and strength, Pasco prestige is built on the distinctive spoke lacing, the safety-locking device and the method of maintaining the standard 56-inch tread. The demand for Pascos is increasing every day. There still may be an opening for a sales station in your territory. Write us today.

NATIONAL WIRE WHEEL WORKS, Inc.

General Sales Offices: DETROIT, MICHIGAN

Factory: HAGERSTOWN, MD.

NORTHERN ELECTRIC COMPANY, Ltd.
MONTREAL

From the Truck and Trailer Field

The Value of Motor Trucks in Short-Haul Problems.

So great has become the terminal expense incidental to the short-haul problem that a member of the Interstate Commerce Commission recently stated that, in his judgment, terminal and haul rates should be separated.

The average expense of hauling a ton of freight 240 miles has been estimated at 74 cents, while the expense of handling the same ton of freight at the terminals is 75 cents, besides, a freight train spends 12 hours in the terminal for every hour spent on the road.

A comparison between the rates of the motor truck and other forms of transportation in short hauls will be in favor of the motor truck. In the matter of time, also, the comparison is in favor of the truck. For instance, the total freight rate between New York and Philadelphia is 63 cents, and the time for transportation is 10 days to two weeks. Express rates amount to \$1.17; time for transportation two days. Motor trucking per 100 lbs. between these two points is 65 cents to \$1, and the time for transportation is overnight.

It is practically impossible to arrive at the definite number of horses that can be replaced by a motor truck, but it is obvious that a three-ton motor truck, on account of its greater speed, can do at the least possible estimate three times as much as a two-horse team.

Frequently, in the case of the motor truck, it is not necessary to pack the goods. Here alone is a considerable saving in labor and expense. Packing and the weight of packing adds to the total freight weight because it adds to the total weight of the article shipped.

As a rule, in truck transportation there are but two handlings, one onto the truck and one off the truck. Therefore, goods are much less liable to damage. These handlings take place outside the jurisdiction of the shipper, and for this reason the amount of goods damaged by railroads is surprisingly large. Goods are infrequently damaged when handled by motor trucks, and in such instances claims can be immediately settled. One motor truck concern operating between Detroit and Toledo, has handled 5,000 packages with but three damage claims.

The saving in the use of the motor truck does away with the interest on the money invested in the shipment. Merchandise costing \$5,000 usually lies in the freight car for two weeks, and the purchaser has an interest charge of \$11.52.

A concern which uses the motor truck system does not have to carry as much

stock as otherwise would be the case, and has less capital tied up. Some concerns pay on a 2 per cent., 10 days' basis. If the goods arrive the day following shipment, via motor service, the purchaser has nine days' time in which to dispose of them. Thus there is the possibility of selling the goods before taking advantage of the 10-day discount as against the possibility of paying, when the transportation is used, before the goods are received.

It is absolutely necessary, in order to carry on a successful business, that the cost of transportation be accurately analyzed. And the more the shipper investigates his transportation problem, the express rates, freight rates, time and labor, the more convinced he is going to be that the motor truck will fit in from every economic standpoint.

Demand Is for Trucks of Two-Ton Capacity and Under.

That nearly one-half of the trucks manufactured during the second quarter of 1919 were of one to two-ton capacity is shown by the interesting figures, taken from manufacturers' records, which follow. It appears that the greatest public demand is for trucks of two-ton capacity and under.

There were 37,373 trucks manufactured in the United States in the second quarter of 1919. Of this number the one-ton type predominates with a total of 7,350; the other figures follow: 1½-ton capacity, 4,568; 2-ton capacity, 4,739; 2½-ton capacity, 1,484; 3-ton capacity, 1,099; 3½-ton capacity, 2,257; 4-ton capacity, 144; 5-ton capacity, 3,166; ½-ton capacity, 3,619; ¾-ton capacity, 6,477; over 5-ton capacity, 587; capacity not given, 1,121; fire apparatus, 122; busses, ambulances, hearses, 39; government trucks, 601.

Interest in Trucks on Farms Greater Than Ever.

A few years ago it was believed that the truck business was purely a larger-city proposition, but conditions have changed a great deal. The small town, even though it is located near a large city, is a productive truck field.

Not only among the merchants of larger cities, but in the surrounding towns as well, a rapidly growing business has been built. Another indication of its growth in the rural and small towns is the organization of tours such as that recently established in the region around St. Louis, Mo.

There were 33 trucks in the line-up and a regular schedule was laid out and maintained. Over 30 towns were visited, talks were made and moving pictures shown.

The reception given the truck train was very enthusiastic and everywhere they stopped farmers came from the surrounding country to view the demonstrations and examine the trucks.

The small-town dealer has come to realize that his business must come in the future from the motor truck, and the distributor of motor trucks is realizing that the smaller communities offer a big field for the sale of trucks.

Making the Truck Pay for Itself by Hauling for Others.

A business man often asks, when approached on the subject of motor trucks, "What is the price?"

It is not, however, the cost of a haulage unit that counts, but the work and saving that the unit will affect. Often that unit will pay for itself.

If a \$500-team makes six 3-mile trips daily, delivering 12 tons, and a \$2,600-truck will make ten 6-mile trips, delivering 20 tons, the truck will double the delivery radius and make nearly twice as many trips and haul more tons per day.

"But my delivery volume does not warrant the purchase of a truck," some merchants will answer. "We could not keep it busy while a team can just handle the work."

With this the average person expects to close the argument, but he hasn't, for this is really no reason for the use of the team.

A team is kept busy all day doing delivery work. A truck will do the work in half a day or less. The initial cost of the truck appears large, but the extra time after the haulage has been completed can be utilized to make the truck pay for itself—by doing haulage for others.

An up-to-date farmer bought a truck, yet he had only two good loads to haul each week, or a partial load each day. He did not hesitate, however, because a truck would make the trip to town in four hours while a team took all day. When he took his milk and produce to town after he had made his purchase, he also took his neighbors' produce and brought back supplies for these same neighbors. The truck paid for itself in the haulage done for others.

A foundry in Vermont put in a 2-ton truck, the total cost of which was \$2,541.14. Its haulage had formerly been done by a local man who charged \$2.50 per hour. The truck in 82 days actually worked 492 hours, which would have cost \$1,230 at the hourly rate. This truck handled the haulage work for \$1,144.99, a saving of \$85 over the former method.

At times when not in use by the foundry



THAT is the basis on which you can sell Harvey Springs. The car owner can trust them absolutely because they are built on such rigid standards that possibility of breakage in ordinary usage is simply out of the question.

Harvey Springs are specially designed for easy riding and great strength. They're boltless—no weak spots in them. And they're tempered exactly right, each leaf exactly the same by the patented Harvey process. Then too, they are put to the supreme Harvey test for strength—a test under such great force that no ordinary spring could endure it. That's why we guarantee Harvey springs against breakage or sagging. The margin of safety, the reserve strength, is so great that Harvey Springs live up to their guarantee even under emergencies.

Harvey Springs mean protection to the dealer—and more sales. Dealers are well supplied with sales helps, movie slides, window decalcomanias and inside wall posters as well as the helpful Harvey Spring Book.

There's a jobber near you who can supply you on short notice with any of the more than one thousand Harvey Springs. Write to us or to your jobber for the new Harvey Book.

**Easy
Riding**

Guaranteed

Harvey Spring & Forging Co.
104A 17th Street
Racine, Wis.

the truck was used for haulage work for other companies. This work was charged at the regular cartage rate of \$2.50 an hour and during the period of 82 days the truck made \$653.26 over and above the cost of the foundry's deliveries. At the above rate of earning the truck paid for itself in 320 days—less than a year.

Ship-by-Truck Movement in Interests of Efficient Transportation.

A great project has been launched in the interests of efficient transportation in the ship-by-truck movement with its attendant establishment of branch bureaus in cities throughout the country to aid truck dealers and truck owners who are engaged in intercity hauling or terminal transference.

The ship-by-truck movement has been promoted principally to emphasize the importance of the motor truck as a transportation medium. This movement is particularly to engage the attention of manufacturers and merchants who have merchandise to ship in small quantities to the outlying districts of neighboring towns and villages.

The plan embraces a ship-by-truck bureau in every city. Each bureau is in charge of an expert and is in turn under the jurisdiction of a central bureau. The aim of each bureau chief is to obtain all the trucking possible in his territory, and list the data so that it can be referred to when necessary for the benefit of the local merchants and traffic managers.

The idea will stimulate the volume of tonnage handling by trucks all over the country. At the present time more than 50 ship-by-truck bureaus have been established in as many cities. The movement is a vital impulse for both the motor truck and the transportation business, and will bring the economy and efficiency of the motor truck as a transportation means to the attention of the business man who has merchandise to ship, as well as joining the hands of the country producer and city consumer.

Highways as Memorials to Be Named After War-Heroes.

Memorials to the dead and tributes to the living in the form of highways is a plan which is catching the popular fancy everywhere. Since France christened a street in honor of President Wilson, Tientsin, China, has done the same thing, and elsewhere suggestions have been made that a transcontinental highway be named in honor of Theodore Roosevelt. Sentiment everywhere is reflected by movements to rename streets after war heroes.

Farmers Are Adopting Trailers as Useful Pieces of Farm Equipment.

Many farmers and fruit growers are adopting the light two-wheel and four-wheel high-speed trailer for use with runabouts and touring cars in hauling to the market small quantities of farm products which otherwise would go to waste.

A trip to town with the family car and a trailer loaded with a few hundred pounds of food products can be made in a couple of hours or less, and at the same time the car is saved the wear and tear on upholstery and the marring of the interior, which is generally the case when

son, Tenn., are buying farm implements. Tractors, especially some of the popular makes, are very much in demand. The reason given by the farmers, themselves, is that they can do twice as much work with the same amount of energy by using scientific implements.

Motor Truck Valuable as a Part of the Farm Equipment.

A recent investigation has been conducted among farmers to learn to what extent they can adopt economically the motor truck as a part of permanent farm equipment. Several interesting facts came to light concerning the stock farm and its relation to the transportation problem.

Among the instances which were brought out by the investigation was the following:

Last July a farmer in Minnesota started out with a number of hogs, ranging from 400 to 500 pounds each, driving them to market. Twelve of the animals died on the road, overcome by heat and exercise. Hogs that day were bringing \$22 per hundred. If each weighed 400 pounds, they were worth \$88 apiece, and the farmer's loss amounted to a total of \$1,056.

It is said that a truck of one-ton capacity with a body suitable for the varied usages of a truck on the farm would cost about \$2,570, not counting war tax and freight charges. This farmer lost nearly one-half the amount of such a truck.

A one-ton truck would take at least eight hogs to market. A number of 32 hogs would require four trips. These trips five miles away would mean a total of 40 miles travel in marketing the hogs by truck, and could easily be done in a day with time to spare.

Uses Tractor and Truck. They Save Time, Do More.

An Illinois farmer, owing to the scarcity of farm labor, has purchased a tractor and truck and now finds that he can do his work more promptly and with greater efficiency than he has formerly been doing it.

In addition to his regular work, this farmer is able to earn a certain amount of cash by plowing for his neighbors. In the spring he starts his work by plowing with the tractor and preparing the soil, and claims that the tractor does much better work than the horses can do.

The tractor is used not only for plowing and disking, but for cutting grain and loading hay. In working for his neighbors he asks \$1 per acre for disking and \$2 for plowing. In the coming season, this farmer does not believe he will have any difficulty in securing higher prices for his services.

Do You Know That —

The estimated available number of horses and mules in the United States before the war was around 25,000,000, and that of Europe at 41,346,000, and half of these numbers were farm horses.

The average farm horse has a maximum walking draft, at a speed of two and one-half miles an hour, of one-half his own weight, and a 1,200-lb. horse can develop around four mechanical horse power.

A truck will carry one-third more grain than a horse-drawn vehicle. It will make three trips of 11 miles each way while a two-horse vehicle is covering the same ground once. Furthermore, the truck works as well at the end of 10 hours as it did at the beginning. Neither does it sicken in the stable and die, nor does it need rest during the heat of the day.

The figures of the United States Department of Agriculture place the annual maintenance of a horse, in terms of produce: three tons of hay, 53 bushels of oats, and a like quantity of corn, or the crops from two and three-tenths acres of hay, one and eight-tenths acres of oats, and two acres of corn.

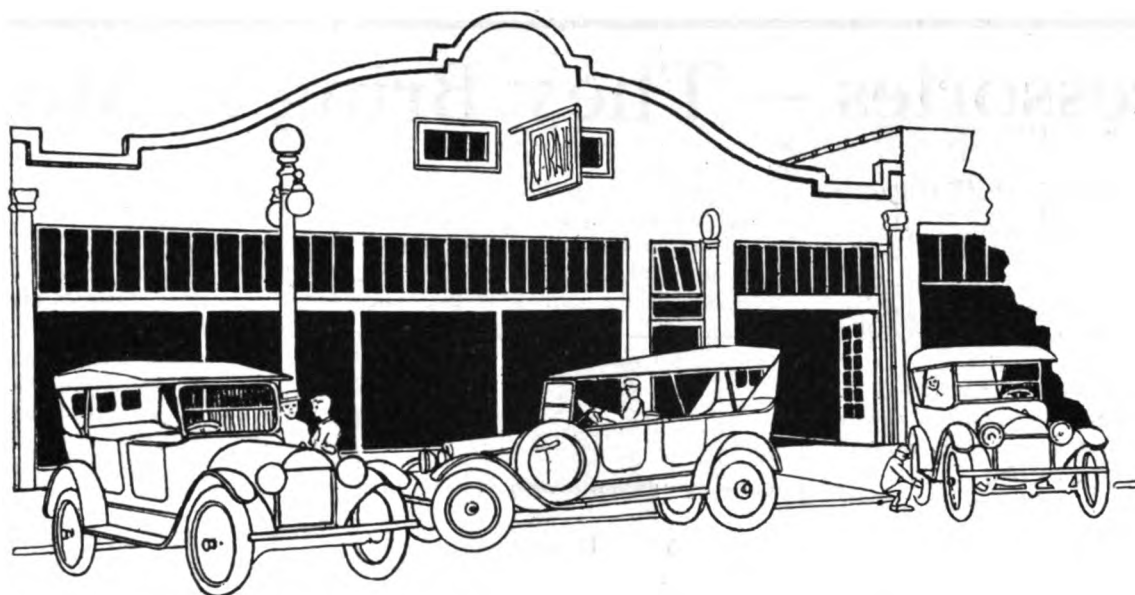
In order to feed all of the horses in the United States the annual hay crop, which amounts to \$740,000,000, is used as horse feed. Most of the yearly oats crop, which amounts to \$334,000,000, is also used for horse feed, and besides the horse eats a very large part of the \$2,000,000,000 average corn crop.

boxes and crates are loaded in the tonneau.

Semi-trailers are used extensively for heavier hauling. Loads of two to three tons are carried on semi-trailers with runabouts and touring cars. The rear deck of the body of the car, back of the front seat is removed and a fifth-wheel device is bolted into the frame over the rear axle. The front end of the semi-trailer is attached to and supported by this fifth wheel.

Farmers Claim They Can Do More Work with Tractors.

In spite of the fact that the crops this year have been only about 75 per cent. normal, farmers in the territory of Jack-



When business is "rushing"—you will find **GLOBE AIR COMPRESSORS** prove their worth.

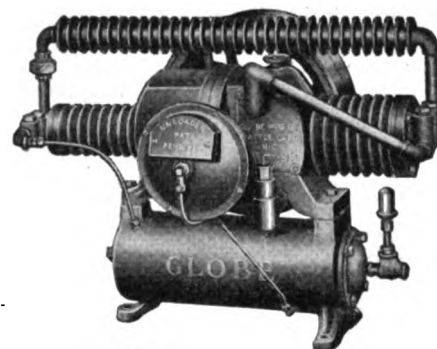
The most desirable air equipment is that which requires the least attention once installed. When there are a number of motorists demanding attention, it is very annoying to take time to see "why the free air won't work."

While you are helping some cranky customer to get his tires inflated, you may lose out on a highly profitable repair job.

The best way to eliminate such trying situations is to have an air equipment that will give dependable service under all conditions.

Globe Air Compressors enjoy an enviable reputation, among garagemen everywhere, for the quick, reliable service they render, and the little attention they require. They represent the latest and highest developments in air compressor construction.

They are made on the two-stage principle that has proved most satisfactory for garage purposes, as it produces ample pressure for inflating the heaviest truck tires.



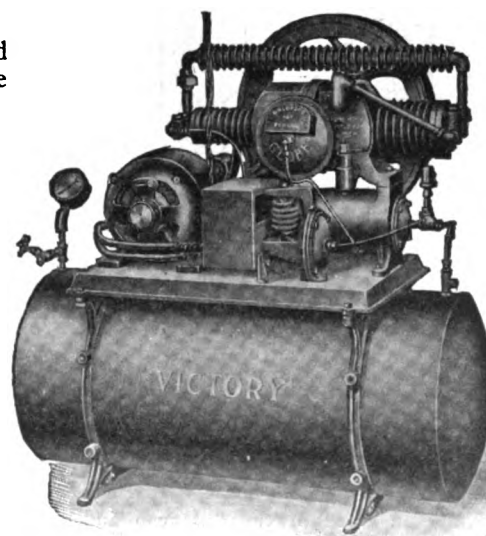
GLOBE TYPE B
Two Stage Compressor for
Belt Drive



"VICTORY-PORTABLE"

Globe Air Compressors are made in many models—among which is one that will meet your requirements. Before buying your air equipment, you will do well to investigate the GLOBE line. May we send you literature?

**Globe Mfg.
Company**
BATTLE CREEK
MICHIGAN



**"VICTORY" Complete Automatic
Motor Drive Unit**

Accessories — They Bring in Money

New Spring with Greater Resiliency and Strength.

A spring for which the makers claim a resiliency without a kick-back, strength without rigidity, and anti-fatigue properties has been introduced by the Higgins Spring & Axle Co.

This spring has no center hole, bolt or hump, to weaken it under stress, and is said to ease over the hard spots with an even jolt free from sway. It has been subjected to a scientific method of heat treatment and is recommended by the manufacturers for all makes of automotive vehicles.

Further information may be obtained by writing to the Higgins Spring & Axle Co., Racine, Wis., and mentioning the American Garage & Auto Dealer.

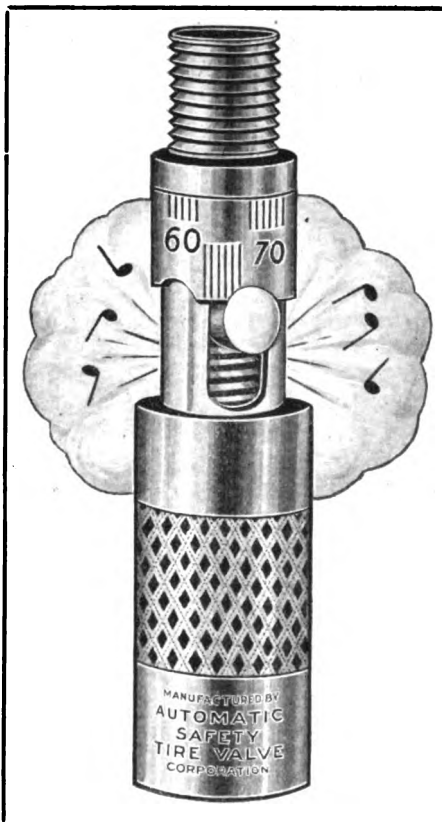
Automatic Pressure Regulator Decreases Tire Bills.

A new automatic pressure regulator which regulates the air-pressure of automobile tires during inflation has recently been put on the market by the Automatic Safety Tire Valve Corporation.

The general appearance of the pressure regulator, which is called the "Whistler," is exactly like that of the dust cap on tire

automatically shuts off the air at the pressure for which it is set, and, at the same time, gives warning by a distinctive whistling sound produced by the excess air.

This whistle is a warning to the owner



General Appearance of the "Whistler."

that the tire is inflated to the right pressure. It does away with the possibility of chance which is liable to result in too much pressure or not enough for economical riding. It assures the owner of correct pressure in each tire at all times and in that way helps to decrease the tire expenses which to a great extent are due to under inflation or over inflation.

In construction, the automatic pressure regulator is very much like a tire gage. The removable collar, with which the desired pressure is regulated, controls a ball and spring valve which will admit no air after the set pressure is reached, but allows the excess air to escape through a port which is so proportioned that a whistling sound is produced.

After the regulator is attached and set for the desired pressure no further attention is required. When a tire is to be inflated the hose is connected in the usual manner and removed when the whistle warns that the proper pressure has been reached.

The manufacturers claim that the use

of the Whistler tire gage will lengthen the life of tires, decrease gasoline consumption, facilitate inflation of tires, and result in a more comfortable riding car, and all because it regulates the pressure.

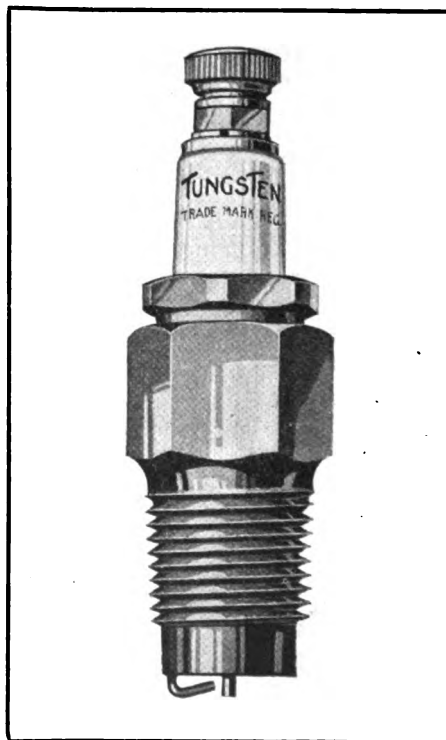
Dealers can obtain circulars and complete information, also special trade prices, by writing to the Automatic Safety Tire Valve Corp., 1765 Broadway, N. Y. City, and mentioning the American Garage & Auto Dealer.

New Sparkplugs for Cylinders Misfiring from Excessive Oil.

For Ford, Overland, and Studebaker cylinders which have become slightly out of round and allow excessive oil to reach the combustion chamber and carbonize sparkplugs in a short time, a new plug has been brought out by the Tungsten Mfg. Co.

The distinctive features of the new plug, the manufacturers say, are an exceptionally large air space which is not easily filled with carbon and oil, and a sleeve below the thread which protects the porcelain from the oil splash and at the same time gives plenty of valve clearance.

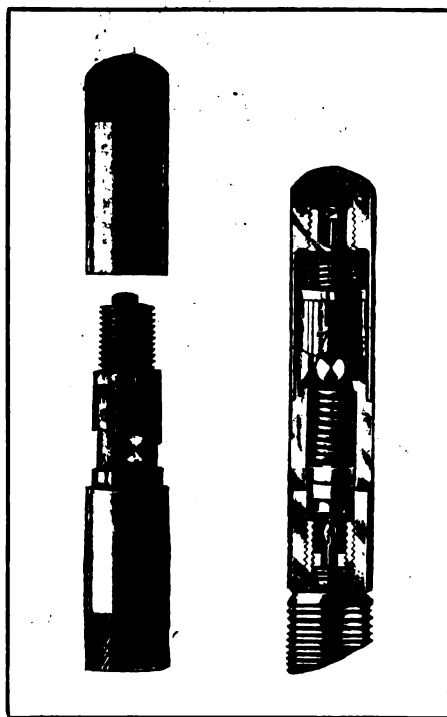
The makers contend that this new type



New Sparkplug Which Eliminates Misfiring.

of tungsten sparkplug will stand more oil and carbon without short-circuiting than any other plug in use.

Dealers can obtain complete information and trade prices by writing to the



Construction of Pressure Regulator.

valves. It is permanently attached to each tire valve in place of the dust cap and the pressure is adjusted by means of a collar which reads pound of pressure.

When the tires are inflated the regulator



Every 2 minutes a National Cash Register leaves the factory

Consider for a moment just what this means

IT MEANS that every two minutes a wide-awake merchant somewhere in the world is installing a modern National Cash Register.

It means that during every ten-hour working day, more than three hundred merchants are convinced that they can conduct their business better with a National Cash Register.

It means that every month in the year more than seven thousand stores are adopting the safe, economical, efficient National Cash Register System.

It means that wherever cash is handled or merchandise sold, the National Cash Register System has come to be recognized as the quickest, most accurate, most economical method of making and recording transactions.

**There is a National Cash Register especially adapted for your business.
Write today for full information.**

The National Cash Register Company
Dayton, Ohio
Offices in all the principal cities of the world

Tungsten Mfg. Co., Marshalltown, Iowa, and mentioning the American Garage & Auto Dealer.

Special Grease Gun for Lubricating Fordson Tractors and Ford Cars.

A special taper nozzle grease gun designed for lubricating Fordson tractors and Ford cars is manufactured by J. H. Haney & Co.

The barrel of the "Rose" Fordson special taper nozzle grease gun, as the product is called, is made of seamless steel, polished inside, and enamel baked outside. The nozzle is taper-type, $1\frac{1}{2}$ inches long by $1\frac{1}{4}$ inches in diameter, and $5/16$ inches at opening, making it possible to pack a Fordson tractor fan hub or the rear axle of the Ford car full of grease without waste.

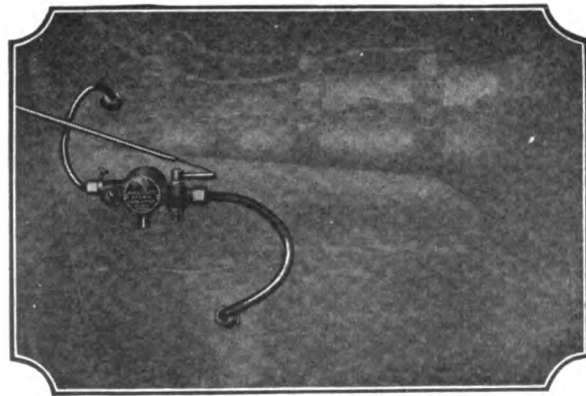
The leather valve, the makers say, is made of leather, tanned under a special process—die cut and formed by special machinery. This gun will handle either soft or hard grease and is said to eliminate waste.

Full particulars and dealers' price lists can be obtained by writing to J. H. Haney & Co., Hastings, Neb., mentioning the American Garage & Auto Dealer.

Steam Carburetor Saves Gasolene, and Eliminates Carbon.

A recently invented device known as the Automatic Steam Carburetor, which, the manufacturers claim, will help to eliminate motor troubles caused by excessive deposits of carbon, develop more power and save gasolene, has been put on the market.

Whenever combustion takes place, a slight deposit of carbon is formed on sparkplugs and cylinders. As the deposit increases, the efficiency of the motor is said to be reduced. The only remedy for this trouble, the manufacturers of the Automatic say, is steam. Water is a chemical combination of hydrogen and oxygen.



Steam Carburetor Installed on Motor.

Hydrogen is combustible—or in other words, it burns. The heat in cylinders is 1,200 degrees and this heat explodes the hydrogen, adding to combustion, and leaving the oxygen to mix with the carbon.

This mixture forms carbon monoxide or carbon dioxide, which passes off through the exhaust.

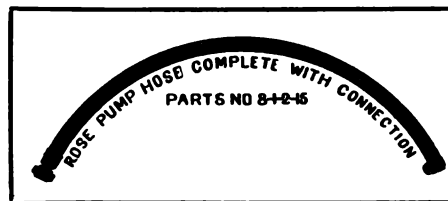
The steam carburetor, the manufacturers explain, is so devised as to make live steam, mix it with heated air from the exhaust pipe by means of an automatic air valve, and to inject this combination into the intake manifold between the gasolene carburetor and the motor.

The steam and hot air mix the gasolene into a vapor, and accompanying this vapor all the way into the explosion chambers, keep it hot. Perfect vaporization is caused in this way, and all the fuel is used, with the result that the operator is given every ounce of the explosive power of the motor and its efficiency is increased to a great extent.

Further information regarding this carburetor can be obtained by writing the Automatic Steam Carburetor Co., 2486 Milwaukee avenue, Chicago, Ill., mentioning the American Garage & Auto Dealer.

New Tire-Pump Hose for Replacements Appears on Market.

A new tire-pump hose for replacements has been introduced by J. H. Haney & Co.



Tire-Pump Hose for All Makes.

This hose, the makers say, fits not only the Rose tire pump, a product of the company, but also fits nearly every other type of tire pump.

The hose is 24 inches long, five-ply fabric, $3/16$ inch hole, one end fitted with the regular No. 1 connection and the other end with a hose band; it can be attached in about two minutes with the aid of a screwdriver. It is packed six in a carton and six cartons to the case.

Further information and dealers' price list can be obtained by writing to J. H. Haney & Co., Hastings, Neb., mentioning the American Garage & Auto Dealer.

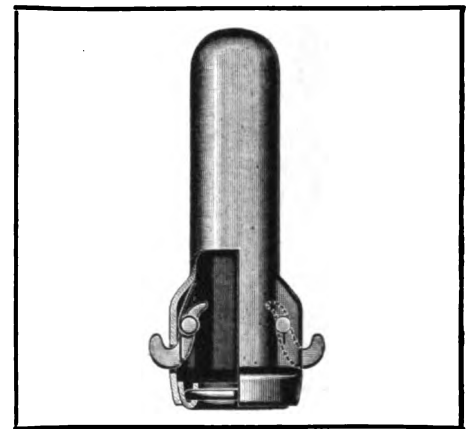
Directory Furnishing Prices on Pistons.

A piston directory which furnishes prices on pistons, finished and semi-finished, standard and oversize, wrist pins and rings for more than 80 makes of pleasure

vehicles and more than 130 makes of trucks has been published by the G. H. Dyer Co.

The demand for oversize pistons, the manufacturers say, is growing very rapidly, for car owners and repairmen are

becoming educated to the fact that new pistons are the only positive cure for such complaints as carbon troubles, oil pumping and piston slap. New pistons properly



New Dust Cap for Inner Tubes.

fitted to reground cylinders or lapped into old cylinders make the operation of the motor and its power as good as when new.

The makers carry in stock pistons of standard size and the $+.0025$ and $+.005$, which are the two regular oversizes for lapping in.

Semi-finished pistons are supplied approximately $1/16$ in. oversize with the center marks left on, with all grooves standard diameters, and the wrist pin hole is rough reamed. If so ordered finished pistons with center marks left on are supplied.

The company is said to have a capacity at present of 300,000 pistons per year, and claims even wall thickness, equal weight and balance for its products. A copy of the directory may be obtained by writing to the G. H. Dyer Co., Cambridge, Mass., and mentioning the American Garage & Auto Dealer.

New Quick-Acting Dust Cap Recently Put on Market.

A newly patented quick-acting dust cap which is said to be easy and rapid to attach and detach, and to possess the additional quality of being ornamental, is brought out by the firm of A. Schrader's Son, Inc.

This dust cap is made of brass drawn into a shell and has two lateral teeth or prongs made of tempered steel which fasten into the thread of the valve-stem.

There is no screwing or turning of the cap to engage the thread of the valve-stem, the manufacturers say. The cap is slipped over the valve-stem as a thimble would be slipped over the thumb. Its clean lines and high nickel finish will tend to have an especial appeal to motorists who are fastidious as to the appearance of their cars.

Those interested can obtain further information and trade prices by writing to A. Schrader's Son, Inc., 783-793 Atlantic Ave., Brooklyn, N. Y., mentioning The American Garage & Auto Dealer.

BRUNNER

Remember When

the future of the garage business was very uncertain and the proprietor could put his garage equipment in a hand bag? The little machinery bought was usually on a price basis. The cheapest that would do the work. Permanence, durability and economy was little considered. Everything was cheap in those days, so operating costs were not seriously thought of.



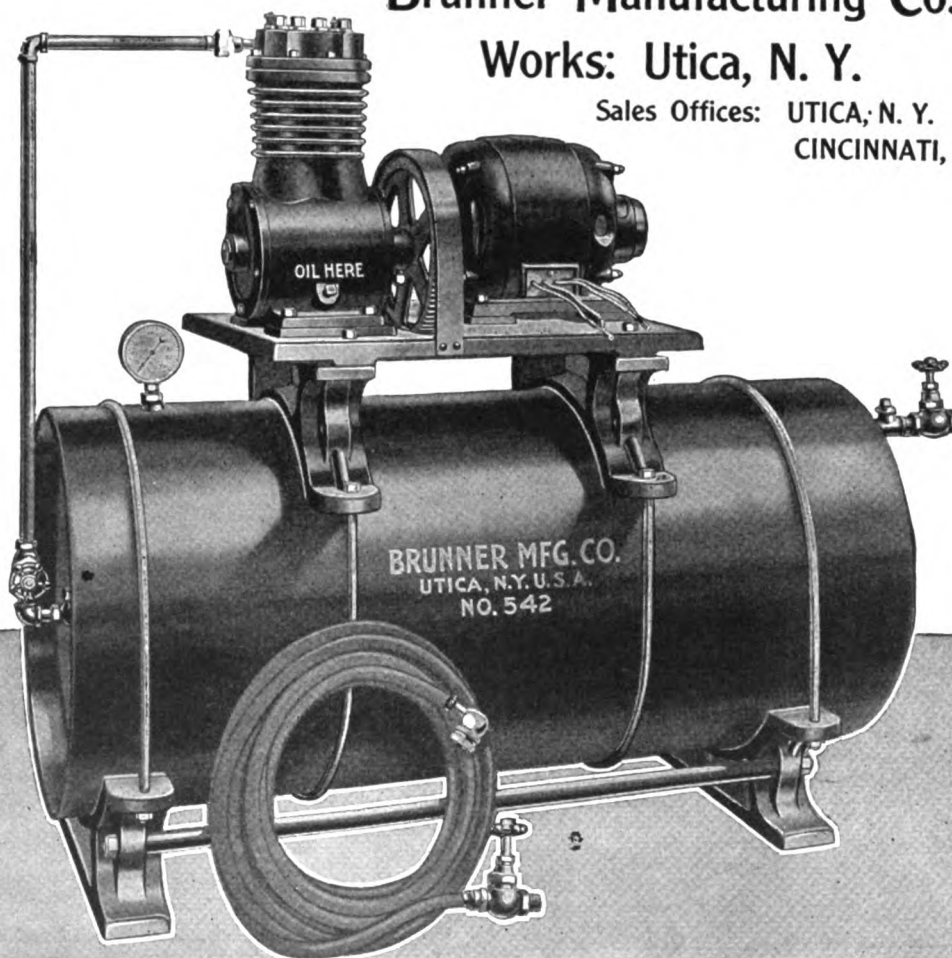
The permanence, progress and prosperity of the garage business has put old time equipment, methods and ideas in the morgue ever to remain. To-day scientific methods, approved practices and the best machinery money can buy is the rule everywhere.

Brunner Air Compressors more than fulfill the present day demand.

Brunner Manufacturing Co.

Works: Utica, N. Y.

Sales Offices: UTICA, N. Y.
CINCINNATI, O.



Garage Equipment for Better Efficiency

SIGNS WHICH STAMP YOUR BUSINESS BEST ADVERTISING.

One of the best methods of advertising the goods you handle is by means of signs. Besides forcibly stamping your product, it also marks you as a progressive dealer and impresses the buying public with the fact that you are prepared to serve them in a business-like manner, with reliability and promptness.

The Oplex signs which have raised snow-white letters on a dark background and which have other distinctive features, are manufactured by the Flexlume Sign Co.

Among the advantages which the makers claim for the Oplex signs are: raised white letters, day and night effect, greatest reading distance and most artistic effect. The feature of a perfect day sign as well as an electric night sign is an advantage which alone makes the Oplex sign individual.

The manufacturers have a large assortment of stock signs at bargain prices; these come in different sizes and trimmings. They also furnish sketches showing how your sign will look upon receipt of the necessary information as to kind, size and location.

Automotive dealers should write to the Flexlume Sign Co., Electrical Adv., 1453 Niagara Street, Buffalo, N. Y., for their list of bargain prices of stock signs or for sketches of signs to meet any requirement; mention the American Garage & Auto Dealer.

OIL STORAGE TANKS WHICH MAY BE PLACED IN BATTERY.

Oil storage tanks of varying capacity which may be placed in battery and all be of uniform height are made by Bowser & Co. These tanks vary in capacity but are standard in height and depth, the width only being increased to allow larger capacity.

These tanks are equipped with cradle, track, and dash for emptying the barrels. This method makes it a one-man job and eliminates the loss of oil being left in the bottom of the barrel. They are also furnished with a gauge which gives the approximate number of gallons contained in the tank.

The Bowser pump on these tanks is said to eliminate leaks and overrun measures, as

the pump is built to deliver the exact quantity required. They are further said to be dirt, grit and dust proof, and will keep the oil in its original state of purity.

The Bowser storage tank is built to meet



Schrader Inflating Valve in Operation.

the requirements of the National Board of Fire Underwriters and through its use there should be a material reduction in the fire hazard.

Descriptive circulars and trade price lists can be obtained by writing to S. F. Bowser & Co., Fort Wayne, Ind., mentioning the American Garage and Auto Dealer.

VALVE ELIMINATES WASTE IN DISTRIBUTING AIR.

The Schader inflating valve, which is so constructed that the air pressure is released by pressing the nozzle of the inflating valve against the tire valve and shut off by removing the device from the tire valve, is shown in the accompanying illustration.

Nearly every garageman is acquainted with this valve and with other Schrader products. Those who are not familiar with this air-saving valve should write for circulars and prices to A. Schrader's Son, Inc., 783-793 Atlantic Ave., Brooklyn, N. Y., mentioning the American Garage & Auto Dealer.

No garage or repair shop distributing free air can profitably be without the Schrader universal inflating valve.

The demand for Schrader products has increased to such an extent in the past years that in order to supply dealers and take care of future demands a new addition to the factory is being erected.

HIGGINS SPRING & AXLE CO. TO CONTINUE BUSINESS ON LARGER SCALE.

The officials of the Higgins Spring & Axle Co. announce that they have not disposed of their business equipment and material as stated in several trade papers.

The sale of machinery and stock purchased by the Continental Axle Co. was that of a new department which was created a year ago for the purpose of manufacturing motor truck, trailer, and tractor axles. This, however, has nothing to do with the present plans of the Higgins Spring & Axle Co. It will continue to do business as heretofore, except on a larger scale in the manufacture of springs of all kinds for passenger cars, motor trucks, trailers, tractors, and replacements.

GIANT AIR COMPRESSOR FOR INFLATING ALL SIZES OF TIRES.

A new giant air compressor for which the manufacturers claim higher pressures and an increased capacity has recently been introduced by the United States Air Compressor Co.

This machine is known as the Giant Usaco De Luxe two-stage compressor, and is the evolution of the standard Usaco De Luxe which the company has been manufacturing. This giant compressor has demonstrated its ability, the makers claim, in handling giant truck tires quickly, inflating them to pressure in a remarkably short time without the slightest sign of laboring or overheating which is sometimes experienced with compressors designed a few years ago.

The manufacturers state that several improvements have been incorporated in both the giant and standard Usaco Compressors, including an air purifier which automatically removes any oil or moisture from the machine at intervals, assuring that the purest kind of air will go into the tires, also a fan flywheel which assists in cooling the compressor.

Garagemen should write for circulars and prices to the United States Air Compressor Co., Cleveland, O., mentioning the American Garage & Auto Dealer.



Air Compressor for High Pressures.

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

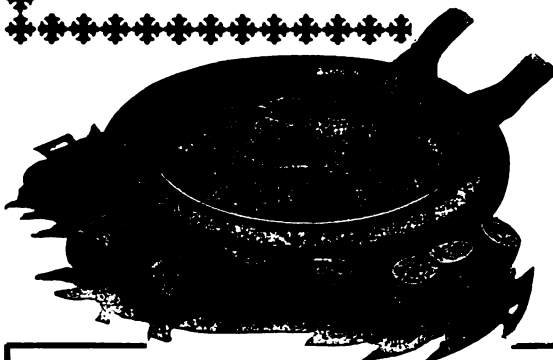
Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....
.....
.....

Name

Address

End Your Tire Trouble Forever



IT brings new happiness and releases you from the horrors of expected tire trouble, making your car more delightful. Think of the joy of riding along without the eternal fear of a puncture or blow-out. Think of getting 10,000 to 20,000 miles out of every tire—no vulcanizing, no patching, no repairing of any kind, doing away with your inner-tube forever by installing in your tires this wonderful and economical

National Rubber Tirefiller

This marvelous substitute for air is being used by thousands and thousands of satisfied car owners throughout the United States and many foreign countries. We have been manufacturing and selling it for more than seven years; selling last year more than 35,000 sets.

National Rubber Tirefiller is made of the best grade of rubber, cut in small particles, treated, molded and vulcanized by our special steam process, in sizes to fit all standard makes of tires. It is laid in your tires and not melted and poured in. It can be transferred from one tire to another. It will not freeze, melt or harden—fully guaranteed against deterioration in any form, or being affected by atmospheric conditions.

Don't let prejudice stand in your way. Good business judgment demands that you at least make a careful investigation. Let us send you full information, sample and prices.

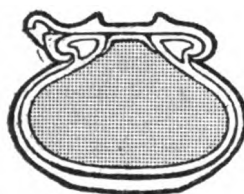
DEALERS—We have a fine proposition for you.

National Rubber Filler Company

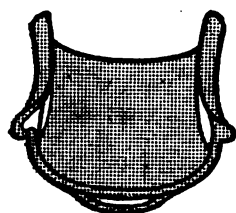
210 College Street

Midlothian, Texas

Proper Inflation is Tire Salvation



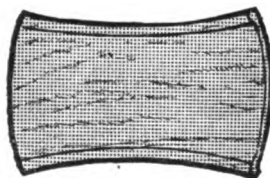
Under-inflated tire. Note the strain on the bead and side walls. Rim cutting and broken down side walls are bound to result from this abuse.



Loosened tread—another example of under-inflation.



Almost flat—imagine the injury to your car, the cost in fuel and oil—carbon accumulation and general discomfort every time you go over a rough place.



Look at the cracks. No wonder the best tires are only guaranteed for 6,000 miles. If you kept Whistlers on them, you'd get nearer 9,000.

Look at these examples of tire-misery caused by under-inflation. Nearly all blowouts are caused by over-inflation.

Why don't you put a stop to tire trouble? Put the

Whistler

TRADE MARK
"IT WHISTLES WHEN IT'S HAD ENOUGH"

on all your tires. You can't make a mistake, for a cheery little whistle says when—and the valve automatically closes.

You'll save 50% to 75% on tires—20% gasoline—66⅔% pumping time (no gauge nuisance) and you have a better car with less repairs.

That's the story that's selling Whistlers. And they are selling with a boom! Repeat orders coming in show better than any words how the Whistler has made good with jobber, dealer and consumer.

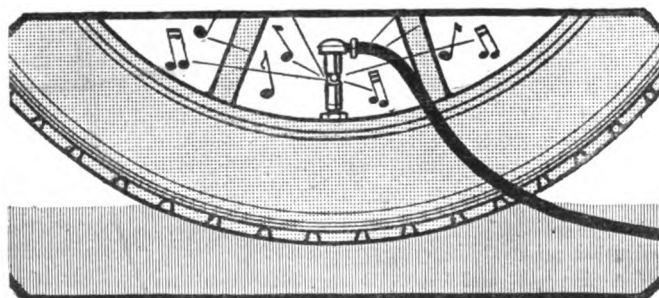
Ask your jobber or write us

THE AUTOMATIC SAFETY TIRE VALVE CORPORATION

1765 Broadway, New York City



Here it is—Screw it on



News of Manufacturers and Jobbers

Editor and Motor News Writer Joins Dunlap-Ward Adv. Co.

After 15 years as an automobile editor and a writer of motor news, Charles G. Reed has joined the Dunlap-Ward Advertising Co., Union National Bank Bldg., Cleveland, which has achieved a nationwide reputation through the successful execution of national advertising campaigns.

In his new connection, Mr. Reed will devote his energies to publicity and sales promotion work for a number of automobile and accessory firms, clients of the Dunlap-Ward organization.

Mr. Reed started his career as automobile editor of the Cleveland Leader at a time when Cadillacs had one lung and curved-dash Oldsmobiles steered with a "stick." While in Cleveland he was sent on all Glidden tours and many shorter contests, covering in all 38 states. For the past four years he has been automobile editor of the Detroit Journal, in which capacity he took an active interest in Michigan highway improvements.

While conducting his departments on the Cleveland Leader and the Detroit Journal, Mr. Reed has written publicity for the Peerless Motor Car Co., Chalmers Motor Co., the old Royal Tourist Car Co., and for many other factories.

Magneto Manufacturers Publish Pamphlet on Engine Ignition.

A small booklet on "Why Magneto Ignition Makes a Good Engine Better" has recently been published by the Magneto Manufacturers, Inc., which comprises the American Bosch Magneto Corp., Ericsson Mfg. Co., Eisemann Magneto Co., Simms Magneto Co., and Splittorf Electrical Co.

The purpose of the pamphlet is to acquaint the owners of passenger cars, trucks, motorcycles, motorboats, tractors, stationary gas engines, or even airplanes, with the theory and application of magneto ignition. For, as it is stated, "Lots of people don't know what a magneto is. Some call the generator of their battery-ignition system a magneto, which is unfair to themselves and to the real magneto."

The introduction goes on to define: "A magneto is the only dependable, self-contained unit that generates high tension, ignition current, and delivers it to the sparkplug without any help from, or connection with, a battery or coil."

The booklet goes into detail explaining the simplicity, durability, and dependability of a magneto, and takes up the question of spark intensity as connected with greater power, gasoline saving, and winter

starting, and concludes with proofs of magneto supremacy. It is well illustrated with diagrams and illustrations explaining the application of the magneto, while the text matter is written in a very non-technical and interesting manner.

All those who are interested in the subject of ignition, can obtain a copy of this pamphlet by writing to The Magneto Mfg. Co., Inc., New York City, mentioning the American Garage & Auto Dealer.

A. H. Collins to Head New Automobile Corporation.

Announcement has been made by the officers of the Collins Motors, Inc., that its general offices have been located at Huntington, Long Island, where a large plant will be built. Metropolitan sales and export offices will be in New York City.

A. H. Collins, former vice-president of the R-C-H Corp., Detroit, is at the head of Collins Motors, Inc., which includes in its personnel many men of prominence in the business world of New York City. Mr. Collins, together with William R. Brewster, Spencer C. Smith, Charles H. Stoll, and Henry S. Brush, comprise the directorate of the company.

It is planned to demonstrate to the world, and especially to the wealthy purchasers of foreign-made cars, that it is not necessary to go abroad to secure a motor car having the distinctive features hitherto found in foreign-made cars.

Early announcement of the product of the company will be made. At this time, Mr. Collins imparts only the information that two chassis are in course of design, and that all bodies will be especially designed to suit the most fastidious tastes.

The Rogers Magneto Recently Put on the Market.

The Rogers magneto, made by the Vita Manufacturing Co., of Cleveland, has recently been put on the market.

This magneto is the invention of George D. Rogers, at one time engineer for the Standard Oil Co. Leaving this organization, he became identified with the Winton Co., the Peerless Motor Car Co. and the Continental Motors Co.

For the benefit of army engineers a test of the Rogers magneto was made in Washington. Nails were driven through the condenser and chunks were cut from it, yet it continued to function with undiminished effectiveness. In other tests, the Rogers coils, which are impregnated by a special process, were submerged in water for a week. At the end of that time they were torn down and found perfectly dry.

Trailer Company Changes Name and Increases Capital.

At a special meeting of the stockholders of the Ohio Trailer Co., held in Cleveland, October 1, 1919, it was decided that the name of the company should be changed to the Ohio Motor Vehicle Co., and that the authorized capital should be increased from \$300,000 to \$1,000,000.

The new company will continue under the same management and directorate in the production of Ohio trailers and will also build a six-cylinder pleasure car. Contracts have already been placed with the leading automotive material manufacturers and a definite production schedule will be well under way on or before the first of the year.

Harrison H. Boyce Becomes Owner of Automatic Fire Extinguisher.

Negotiations have recently been completed whereby Harrison H. Boyce of the Moto-Meter Co., Inc., becomes sole owner of the fundamental Erwin patent, recognized in the fire extinguisher field as basically covering automatic means of extinguishing fires under the engine hood of passenger cars, trucks, and tractors.

It is reported that Mr. Boyce is contemplating forming a new company for the exploitation of this invention; and that the new fire extinguisher will embody many new features and will sell at a popular price.

Prominent Jobber Sells Interests to Enter Manufacturing Field.

After five years as part owner and general manager of the Northwestern Auto Supply Co., accessory jobbers at Billings and Great Falls, Mont., and Pocatello, Idaho, Edgar C. Guthard has sold his interests in that concern in order to devote his time exclusively to his new business, the Edgar C. Guthard Co., manufacturers of Billmont master wrenches, at Chicago.

The former manager of the Great Falls branch of the Northwestern Auto Supply Co., Dan Cheerier, on September 1 became Middle West representative for the Guthard line.

New Plant Being Erected by Vita Manufacturing Co.

The first unit of the new plant which is to be used for manufacturing the Rogers magneto is being erected in Cleveland by the Vita Mfg. Co. The building will be two stories in height, of modern concrete, fireproof construction, with a front of velvet-faced brick. It will be erected

UNIVERSAL BATTERIES

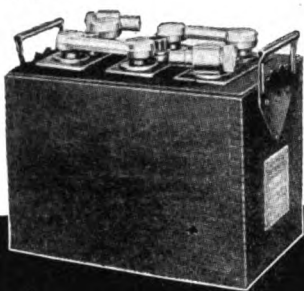
The Heart
of any good
starting and
lighting
system

UNIVERSAL BATTERIES are built to wear; to give long life and complete satisfaction.

UNIVERSAL BATTERY SERVICE is complete. It means prompt, efficient delivery of all batteries and repair parts.

There is a *Universal Starting and Lighting Battery* for every make of automobile, and there is a *Universal* repair part, plate, terminal, connector, separator, etc., for any make or size of battery.

Write for illustrated catalog.



Dealers, Garage Owners, Service Station and Supply Men; write for special agents' proposition.

Universal Battery Co.

3414 S. LaSalle St.

Universal Battery Co
Chicago

STORM

Tools That
Are
ALL SERVICE

Main Bearing, Babbitting and Boring Tools

"Put New Bearings in Old Ford and Fordson Blocks"

SIMPLE
STURDY
ACCURATE

These tools do a regular factory job.

Perfect alignment;

Proper gear position;

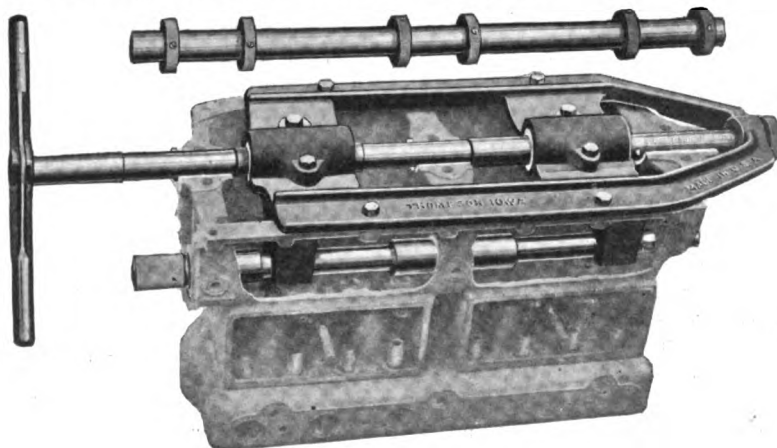
Rebabbitts and bores a set of perfect bearings in less than twenty minutes.

You need these tools in your shop. Why delay? They will make you money and friends.

Ask for Bulletin F 42.

STORM MFG CO.

406 Sixth Ave. South
MINNEAPOLIS - - - - - MINN.



No. 230 Main Bearing and Boring Tool for Ford - - - - \$70.00
No. 231 Main Bearing and Boring Tool for Fordson - - - - \$95.00

without partitions and will be of sufficient strength to permit the addition of other floors as needed. A large garage for the company's automobiles and those of its officials will be erected in the rear.

The Vita Mfg. Co. was organized to manufacture and market the Rogers magneto designed and invented by George D. Rogers, who has been identified with the ignition of internal combustion engines since its inception. This magneto, it is claimed, will produce a hotter spark because of its great magnetic area, which is increased from 100 to 300 per cent. over other magnetos.

It is applicable to internal combustion engines from 2 to 16 cylinders and because of its wide range of application opens a new field in airplane ignition and claims to add power and flexibility to the motor for passenger, commercial motor car or tractor.

Fallacy to Buy "Seconds," Says One of the Tire Manufacturers.

"It is fallacy to buy seconds in tires," says one of the tire manufacturers. "The 'second' tire is sold as such because it is imperfect and is so acknowledged by the maker when he brands it as 'second.'"

"When a manufacturer brands the tire as 'second' he waives all responsibility for it, which means that he will not stand back of it if the expected happens—if it goes wrong. Of course, there are tires now and then that are not structurally at fault and which will give just as good service as perfect casings, but these examples are few and far between.

Responsible tire manufacturers are very jealous of their reputations, so when they brand tires as 'seconds' they also buff their names off these casings. The safest course for the reputable tire manufacturer is to retain and destroy all imperfect casings, never letting them get out on the market or in the hands of tire users.

Of course, manufacturers might find it expensive to destroy seconds, but this should not be the case. The per cent. of defective casings turned out by tire manufacturers is negligible."

New Company Organized for Manufacture of Passenger Cars.

It is announced that Lee, Higginson & Co. have organized, under the laws of Delaware, the Lafayette Motors Co., which will manufacture passenger motor cars.

The officers of the company are Charles W. Nash, the present president of the Nash Motors Co., who will occupy a corresponding office with the new company; James J. Storrow of Boston, chairman; D. McCall White of Indianapolis, and Earl C. Howard, also of Indianapolis, vice-presidents.

The company has purchased a modern, fireproof, three-story factory building in

Indianapolis, 500 by 54 ft., equipped with modern machinery. As the factory site contains about 25 acres of land, it affords sufficient space for extensions when they are needed. Indianapolis was selected because of the manufacturing and distributing opportunities which it affords.

Mr. White has designed the new car which the company is to manufacture, and it is expected that it will be ready for exhibition in January.

Complete Line of Copper-Asbestos Gaskets for All Engines.

Copper-asbestos gaskets of the closed or open type for all makes of engines are being made by the McCord Mfg. Co. The line of gaskets includes sparkplug gaskets, exhaust and flange-type gaskets, exhaust-manifold gaskets, and cylinder-head gaskets for passenger cars, trucks, tractors, and airplanes. The concern also carries an assortment of shim stock as well as other miscellaneous gaskets of the open and closed types.

Recently the company published an interesting catalogue listing the various types of sparkplug gaskets, exhaust-manifold gaskets, together with sizes and price lists. The catalogue also lists cylinder-head gaskets for all makes of cars and a good number of trucks, tractors, and airplanes. These are illustrated and numbered so that it is only necessary to consult the list and find the gasket to fit the particular need of the owner or repairman.

Display boards which contain all the smaller gaskets used on the popular cars are furnished to dealers. The board is simple and neat, but sufficiently heavy to prevent warping and to stand any possible careless handling.

BOOK REVIEW.

AUTOMOBILE IGNITION: OPERATION, UP-KEEP, CARE AND REPAIR OF MODERN FORMS OF STORAGE BATTERIES AND MAGNETO IGNITION EQUIPMENT FOR AUTOMOBILES, by H. P. Manly. 428 pages 5½ ins. by 7 ins., 193 diagrams and illustrations; published by F. J. Drake & Co., Chicago. Price \$2.

This book takes up the subject of automobile ignition entirely separate from the care and operation of the automobile. It gives complete information concerning modern ignition systems. Its purpose is to explain the theory of the various systems, and at the same time combine the theory with its practical application so that the average person can readily understand it.

It is written in as non-technical language as possible, and with the idea of being a reference and instruction book for the owner, dealer, garageman, and repairman.

The first chapters are devoted to the explanation of the theory of electricity and

magnetism, followed by explanations of the principles, requirements, and methods of ignition timing. Following this, a chapter is devoted to each of the ignition systems in every-day use, describing and illustrating methods of construction and operation together with adjustments for each individual type. The last chapter covers the location and remedy of ignition troubles and includes systematic trouble location tables.

The book is well illustrated with cuts of all the representative ignition systems and each system is completely and clearly described. Instructions for making repairs and adjustments are gone into detail very thoroughly and are well illustrated to make them clear. The entire volume is devoted to the one subject of ignition, and each principle of operation and method of construction is considered only from the ignition point of view.

New Magneto with Hotter Spark Appears on the Market.

Because of a magnetic area increased from 100 to 300 per cent. and a consequent hotter spark, the Vita Mfg. Co., makers of the Rogers magneto, claim for their product quicker acceleration, more power, a smoother operating motor, and a big reduction in fuel consumption for the passenger or commercial motor car.

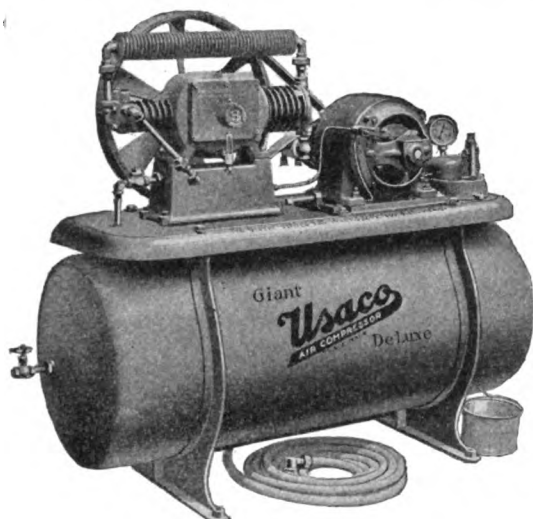
The use of this magneto has been extended to include all motors from the two up to and including the 12 and 16 cylinder internal combustion engines of either single or two-spark type. This magneto is said to give a hotter spark because of the higher voltage and amperage over a greatly multiplied magnetic area. This area is doubled on the two, four, six, and eight-cylinder motor; increased 200 per cent. on the 12 and 16 cylinder engine, and on the Liberty motor is advanced 300 per cent.

The Rogers is said to have several other special features: no moving wires or revolving armatures, a breaker of original and exclusive design, a water-proof coil that is extremely simple and accessible. On the two, four, six, and eight-cylinder motor two sparks are produced per revolution on the rotor shaft

Entire Gasolene Engine Built Up of Sheet Steel Stampings.

An English inventor has built up an entire gasolene engine of sheet steel stampings, and has the commercial development of the idea under way. In a four-cylinder model, two identical stampings form the crankcase. The stampings are bolted together. The cylinders are made of steel-tube linings, a head stamping with valves in place, and pressed-on water jackets. The crank shaft is made of disks with pressed-out portions for hubs and crank pins, the latter telescop-

How much Time to Inflate A Giant Truck Tire



Giant *Usaco* De Luxe
Two Stage Automatic
Air Compressor

PNEUMATIC truck tires are here to stay. Are you equipped to serve them? Have you capacity for the marvelously growing demand on air plants?

To put 130 to 150 pounds into a tire is no pygmy task. It requires a compressor specifically designed for this service and a tank pressure far in excess of this amount.

An ordinary compressor requires too much time for this service even if capable of handling it, and if overloaded to accomplish the end it is sure to depreciate prematurely.

The Giant Usaco De Luxe Compressor, here illustrated, is an evolution of the Standard Usaco De Luxe of which thousands are in use. The Standard Usaco De Luxe is fundamentally a high pressure machine but this Giant Unit affords even greater service and satisfaction.

A larger motor with a compressor of greater capacity, a bigger tank provides greater storage capacity; a new air purifier assures getting the very purest air free from oil or moisture; a fan type flywheel amply cools the compressor. Then there are many other features of value.

Write for circular giving all the facts about both machines.

The United States Air Compressor Co.
6542 Carnegie Avenue
Cleveland, Ohio

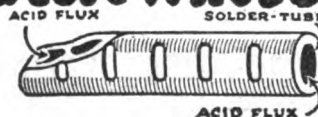
By Far the Best by Every Test

The Magic Wand of Soldering

Using Kester Acid-Core Wire Solder is indeed like soldering with a magic wand, compared with the old method. It banishes the acid pot with the attendant nuisance of hunting, preparing, and applying the soldering flux.



KESTER
Acid Core Wire Solder



The hollow cellular tube contains the soldering flux which feeds with the solder. Sold in 1-lb. coils in cartons, and on 1-, 5-, and 10-lb. spools.

Order from your jobber or direct.



Chicago Solder Co.
CHICAGO - U.S.A.



ing and reinforcing each other from opposite disks.

Six stamps are required for the piston, exclusive of rings, and two are needed for each connecting rod. The method is declared to reduce cost and weight and increase strength and manufacturing facilities.

Electric Motor - Generator Solves Threshing Problem for Farmers.

Because of the scarcity of farm labor and the large crop of wheat, a number of western farmers have been obliged to do some of their threshing at night.

They are using a portable electric motor-generator outfit for this purpose. The motor not only furnishes power for the threshing machinery, but also current for the lighting equipment it carries. The power is either generated by a gasoline engine, or is secured by tapping the transmission lines that are growing numerous as water-power development proceeds.

The use of the farm electric-plant which costs from \$300 to \$500 to install is rapidly increasing. In this way the electric iron, electric heater, toaster, washing machine, and many other conveniences and comforts are finding their way into the farm home. The current is also used for running cream separators, milking machines, grindstones, bottle washers, water pumps, and the like. Some farmers employ small individual motors, but the portable motor seems to be more favored.

Tire Company Calls Webster Authority on Tires.

That many a motorist or garageman would receive a shock if he consulted the dictionary on the subject of tires is the belief of one of the large tire companies, because Webster says that it takes a casing and a tube to make a tire.

To quote him exactly, he says: "A tire is a flexible tube, usually of rubber, inflated

with air and protected by an outer covering, used on motor cars to reduce vibration and shock."

Many persons speak of their "tires" when they mean their "casings." The latter word has been approved as the correct designation of the "outer covering" referred to by Webster.

Demobilized Army Units to Help Build Roads in England.

Grants amounting to \$50,000,000 will be distributed by the British road board for the reconstruction of roads and bridges in England in 1919. Demobilized army units will be used to do the labor. Local highway authorities will be required to match this appropriation by at least as large a program of road work as they carried out in the year before the war. Area taken into consideration, England's program is thus far in excess of that of the United States including both Federal Aid and state funds.

**AUTOMOBILE
SPRINGS**
MANUFACTURERS AND SPRING SERVICE
GARDEN CITY SPRING WORKS
2300 Archer Ave. Chicago



**All the
"comforts" of home in the
modern train**

America's big railroad men during the past half century have devoted intensive efforts to making travel by rail more comfortable and enjoyable. We have, likewise, studied the problems of imparting comfort and pleasure to riding in a Ford, and as a result of our efforts

You get that same "comfy" feeling with W & C SHOCK ABSORBERS

They help steering, prevent side sway, save tires, and stop the triangular pull that wears out the bearings.

Over 200,000 sets in use.
Write for our trade proposition.

P. H. WEBBER CO.
Hoopeston, Ill.



KENNEDY Auto Storage Covers

furnish efficient protection for cars in dead storage. They are made of strong, heavy paper, properly reinforced, and in standard sizes to fit any car.

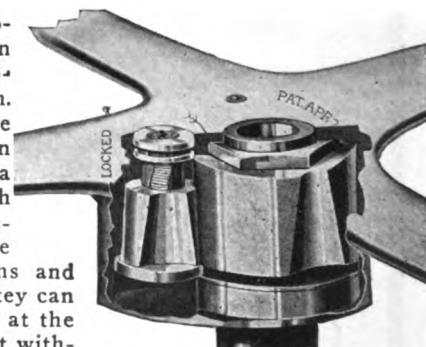
Made only by

THE KENNEDY CAR LINER & BAG CO., Shelbyville, Ind.

"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."



Approved by the Underwriters' Laboratories,
and affords 15% discount on insurance.

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

Write today for particulars.

THE RELIANCE COMPANY

411-417 So. Sangamon St.,

CHICAGO, ILL.

Distributors in every state



**Introducing the
Latest Idea**

ROTARY AIR COMPRESSORS

For All Purposes

ADVANTAGES WORTH CONSIDERING

Slow Speed. No Vibration. Positive Displacement.
High Overall Efficiency. Very Low Cost of Upkeep.
No Expensive Foundations.

Easy to Install. Perfectly Balanced. Quiet in
Operation.

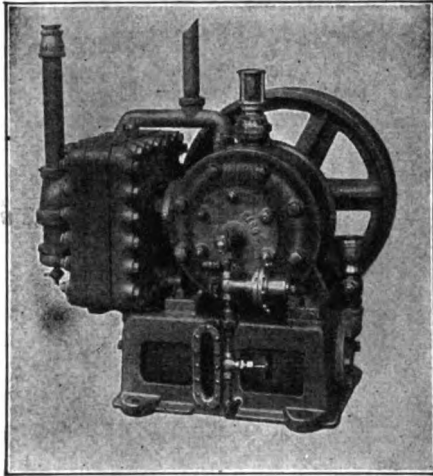
Check Valves on Discharge. No Valves on Intake.
Simple to Operate.

*Weights Less Than One-Half of Other Types.
All Bearings Hyatt Roller—"High Duty." Only
Five Moving Parts Always Running in Oil.*

Write for Descriptive Matter, Prices and Delivery

JACKSON COMPRESSOR COMPANY

Denver, Colorado, U. S. A.



Rotary Garage Compressors

THE service the tractor gives the user depends entirely upon the lubrication. Inaccessible parts can be lubricated with either hard or soft grease with the Rose Tractor Taper Nozzle Grease Gun. 19½" long by 1½" diameter.

List Price \$2.50

Handled by Most Jobbers and Dealers

Manufactured and Guaranteed by

J. H. Haney & Company
Hastings, Neb.

**ROSE
TRACTOR
GREASE GUN**

Lubricates with out waste



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Brighten Up
for the dark winter days
—they are coming



ERECT A FEDERAL ELECTRIC SIGN

In the dark days and long nights that are coming, the Federal Electric Sign will serve to remind old as well as prospective customers that you are always ready to take care of their needs. By keeping your name and location fixed in their minds they will know where to store their cars for the winter months. It will keep the entrance to your garage cheerfully lighted and will attract the attention of those who run their cars the year round.

The Federal Electric Sign, being made of porcelain-enameled steel, will not rust, decay, fade or crack whether in mild summer or zero winter weather. Costs only a few cents a day for current—no other maintenance expense. An occasional washing keeps it bright and shining like new.

—12 Months to Pay

The first payment brings you the sign. It will work day and night for you while you complete the payments and will continue to boost your business for years to come. Send coupon today for complete information—no obligation.

Send Coupon Today

Federal Electric Company

Representing
Federal Sign System (Electric)
Lake and Desplaines Sts., Chicago

Please send full information on Enameled Steel Sign for my business and your 12-months-to-pay plan. No obligation.

NAME

ADDRESS

BUSINESS

AGAD-19

Every day
Any Garage:
Just received
your monthly
statement and
note you have
overcharged us
for repair work
(Any) Motorist

**This would not happen
with a CALCULAGRAPH**



It records and prints the actual elapsed time on repair jobs—eliminates errors and prevents disputes.

The easiest, quickest way of computing repair charges.

Write today for booklet No. 11, describing a simple garage cost system.

**Calculagraph
Company**
Dept. 77
30 Church St.
New York

"AM-PĒ-CO" PRODUCTS

Sell readily because their superiority
is well known to the Motoring Public

AM-PĒ-CO" PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. "AM-PĒ-CO" Pistons are uniform in weight, mechanically accurate and true to measurements.

MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes.

We also make the famous "AM-PĒ-CO" WHEEL PULLERS and BRAKE SHOES, both one- and two-piece.

If your jobber does not handle "AM-PĒ-CO" Products, write us direct.

F. H. & S. COMPANY, 624 So. Michigan Blvd., Chicago

General Selling Agent for

**American
Machine
Products
Co.**

Marshall-
town,
Iowa

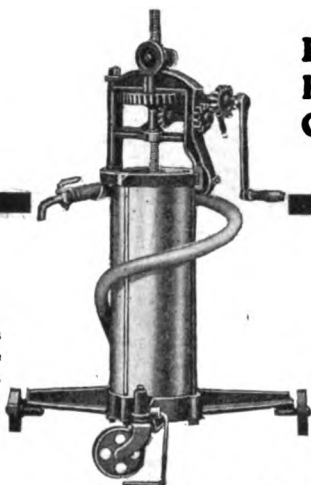


Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

**POURS
OUT
STEADY
PROFITS**

**ENTIRELY
HAND
OPERATED**

Model K holds
20 lbs. grease
or 2½ gals. oil.



Model N holds
56 lbs. grease
or 7 gals. oil.

Ekern "Model N" Portable Garage Grease Gun

Undoubtedly there is scarcely any garage equipment which is absolutely indispensable; yet there are a few products which come mighty close to being necessary. Among these, our "MODEL K" and "MODEL N" PORTABLE GARAGE GREASE GUNS are very prominent.

Address us today for full particulars.

H. G. Paro Co.

**1412-14 South Michigan Blvd.
CHICAGO, ILL.**

GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company

1002 Washington Boulevard
Chicago, Illinois

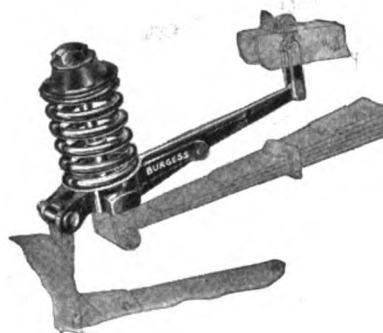


BURGESS **"TRIPLE" PATENTED "DUTY"** **REBOUND CHECK AND SHOCK ABSORBER**

Your record of maintenance costs will quickly show you the real value of the Burgess "Triple Duty" Rebound Check and Shock Absorber.

It lowers depreciation, tire costs and gives you more miles on every gallon of gas.

Because it accomplishes what is claimed for three devices, because it smoothes out all the big bumps, sharp jolts and the rapid road vibrations, it has earned the reputation of being the most efficient and economical shock absorber ever put on a Ford car.



Just a postcard will bring you full particulars

**Manufactured by
W. S. Burgess
Mfg. Co.
St. Joseph,
Michigan**

**Sales Dept.
The Zinke Co.
1323 Michigan
Avenue
Chicago**



**It's a happy
garageman
who has a
HOLMES
WRECKING
TRUCK**


This advertisement actually expresses the attitude of hundreds of garagemen and repairmen who have a **HOLMES WRECKING TRUCK**.

Regardless of the wrecked condition of the car, it can be readily "towed in" with a **HOLMES**.

Staunchly built, frame and wheels of malleable iron castings, Hyatt roller bearing for wheels and tongue of second growth ash.

PRICE, \$50.00
Special Discounts to Garages and Dealers.

ROBERT HOLMES & BROS.
DANVILLE, ILLINOIS



GARAGE

A. Schrader's Son
Brooklyn N.Y.

Kindly hurry that order for Inflating Valves. We had no trouble with our Free Air Station as long as we used this Valve but when we had to put in another make, — the fun began.

EXTRACT FROM ACTUAL LETTER RECEIVED.



**Better Soldering
with Less Labor**

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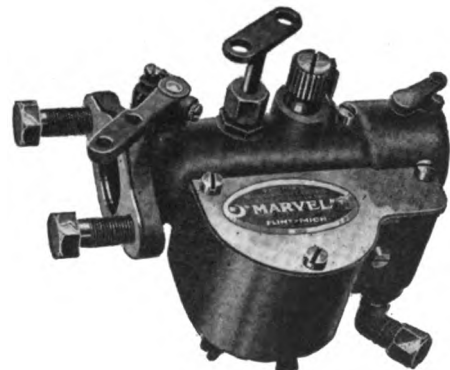
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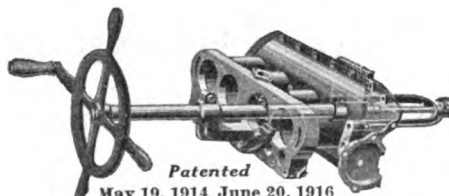
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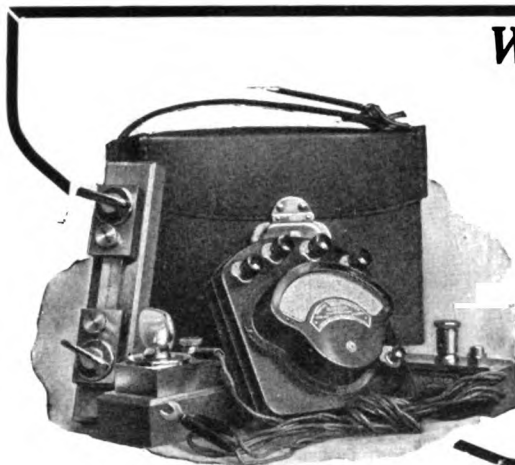
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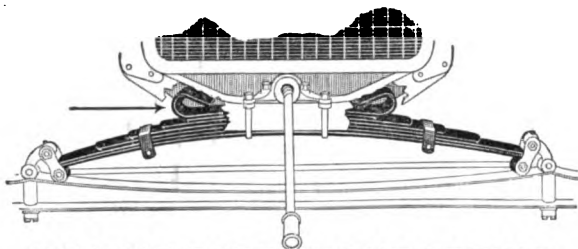
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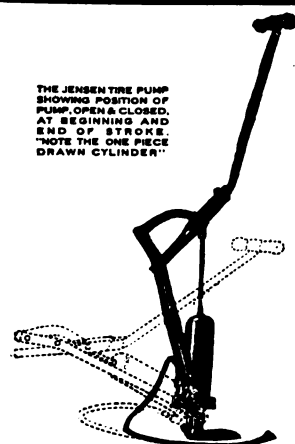
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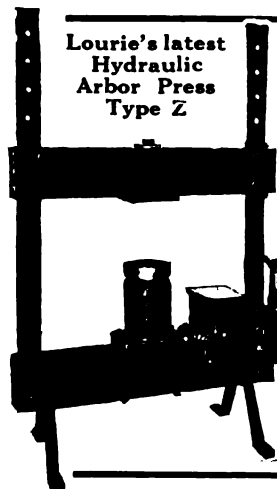
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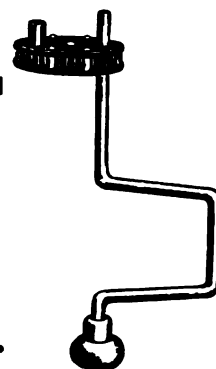
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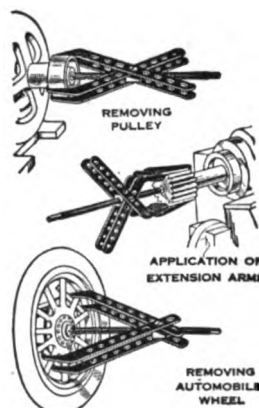
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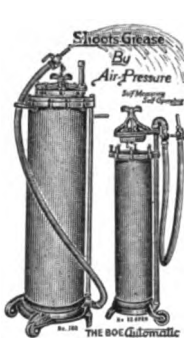
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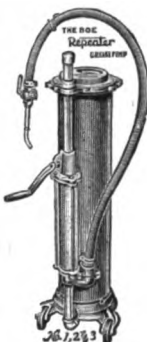
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Bird Equipment Co., 324 W. Ohio St., Chicago.
Calculagraph Co., 30 Church St., New York.

TIRES

American Accessories Co., Cincinnati, O.
Famous Tires Corp., 295 Babcock St., Buffalo, N. Y.
Leo McDaniel Rubber Co., Cairo, Ill.
Miller Rubber Co., Akron, O.
Thompson Tire & Rubber Co., Elmore, Minn.

TIRE PRESSURE REGULATORS

Automatic Safety Tire Valve Co., 1765 Broadway, New York City.

TIRE REPAIR EQUIPMENT

Atlas Auto Supply Co., 680 W. Austin Ave., Chicago, Ill.
Haywood Tire and Equipment Co., 650 No. Capitol Ave., Indianapolis, Ind.
C. A. Shaler Co., Waupun, Wis.
Triangle Rubber Co., Oklahoma City, Okla.
Zinke Co., 1323 So. Michigan Ave., Chicago.
Ben's Big Tire Shop, 378-382 Queens Blvd., Winfield, Long Island.
Leo McDaniel Rubber Co., 864 Commercial Ave., Cairo, Ill.
Miller Rubber Co., Akron, O.

TIRE TOOLS

Trexler Co., Philadelphia and 2111 Michigan Ave., Chicago.

TRANSMISSION LINING

Advance Automobile Accessories Corp., 56 E. Randolph St., Chicago.

VALVES

Romort Mfg. Co., Oakfield, Wis.
A. Schrader's Son, Inc., 788-798 Atlantic Ave., Brooklyn, N. Y. (Automatic Inflating Valve).

VULCANIZERS

C. A. Shaler Co., 353 Fourth St., Waupun, Wis.
Vanderpool Vulcanizing Co., Springfield, Ohio.

WELDING AND EQUIPMENT

Bermo Supply Co., Omaha, Neb.
Frank Chas. Owens, 19 No. Morgan St., Chicago.

WRECKING TRUCKS

Robt. Holmes & Bro., Danville, Ill.

WRENCHES

Au-to Compressor Co., Wilmington, Ohio.
The Graham Roller Bearing Co., Coudersport, Pa.
Sawyer Sales Co., 50 Terminal Bldg., Lincoln, Neb.

Index to Advertisements

| A | | K | |
|----------------------------------|----------|------------------------------------|-----------|
| Advance Automobile Access- | — | Kennedy Car Liner & Bag Co.. | 66 |
| ries Corp. | — | L | |
| American Bolt & Screw Case | 72 | Lawrence & Co., L..... | — |
| Co. | 72 | Lourie Mfg. Co. | 73 |
| American Machine Products Co. | 68 | M | |
| American Technical Society.... | 77 | McDaniel Rubber Co., Leo.... | 72 |
| Atlas Auto Supply Co. | 8 | Marvel Carburetor Co. | 71 |
| Auto Compressor Co. | 45 | Marvel Machinery Co. | 39 |
| Auto Engine Works. | 74 | Miller Rubber Co. | 77 |
| Auto Wrecking Co. | 74 | Monarch Machine Tool Co. | — |
| Automatic Safety Tire Valve | 61 | Mutual Truck Co. | 48-49 |
| Corp. | 61 | N | |
| B | | National Cash Register Co.... | 57 |
| Bailey-Drake Co., Inc. | 37 | National Rubber Filler Co.... | 61 |
| Baird Equipment Co. | 72 | National Wire Wheel Works.... | 51 |
| Beck & Corbitt Iron Co. | 75 | New Era Spring and Specialty | — |
| Bens Big Tire Shop. | — | Co. | 73 |
| Bermo Co., A. G. | 73 | New York Coil Co. | — |
| Boe Co., H. M. | 75 | No-Leak-O Piston Ring Co.... | 75 |
| Brunner Mfg. Co. | 59 | Norma Company of America, | — |
| Butler Mfg. Co. | 74 | The 6 | |
| Burgess Mfg. Co., W. S. | 69 | O | |
| C | | Owens, Frank Chas. | 75 |
| Calculagraph Co. | 68 | P | |
| Cassey-Hudson Co. | — | Paro, H. G., Co. | 69 |
| Cassidy Co., Edward A. | — | Phillips, H. E., & Co. | 73 |
| Catalan, Andre G. | 74 | Ponderlick Bros. | 70 |
| Champion Pneumatic Machin- | — | Premier Electric Co. | 75 |
| ery Co. Inside Back Cover | — | R | |
| Chicago Solder Co. | 65 | Reliance Co. | 66 |
| Curtis Pneumatic Machinery | — | Romort Mfg. Co. | 71 |
| Co. | 33 | S | |
| D | | St. Paul Auto Cylinder Grind- | — |
| Denby Motor Truck Co. | 7 | ing Co. | 75 |
| Dunton Co., The M. W. | 70 | Sawyer Sales Co. | 73 |
| E | | Schrader's Son, Inc., A. | 70 |
| Ever-Tight Piston Ring Co.... | 5 | Shaler Co., C. A. Front Cover | — |
| F | | Standard Auto Salvage Co.... | 74 |
| Fairbanks Company. | 40, 41 | States Chemical Co. | — |
| Famous Tires Corp. | 74 | Storm Mfg. Co. | 63 |
| Federal Electric Co. | 68 | Sunderland Machinery & Sup- | — |
| Flexume Sign Co. Back Cover | — | ply Co. | 74 |
| Foster Bros. Mfg. Co. | 75 | T | |
| G | | Thompson Tire & Rubber Co.. | — |
| Ganschow Co., William. | 69 | Times Square Auto Supply Co. | — |
| Garden City Spring Works.... | 66 | Trexler Co. | — |
| General Utility Co. | 4 and 43 | Triangle Rubber Co. | — |
| Globe Mfg. Co. | 55 | Trione Piston Ring Co. | 37 |
| Graham Roller Bearing Co., | — | Tubular Woven Fabric Co. | 47 |
| The 72 | — | Tungsten Mfg. Co. | 3 |
| Gray-Heath Co. | — | U | |
| Greer College of Motoring.... | 74 | Universal Battery Co. | 63 |
| H | | Universal Mfg. & Sales Co.... | 75 |
| Halladay Co., L. P. | — | U. S. Air Compressor Co.... | 65 |
| Haney & Co., J. H. | 67 | Utilities Sales Corp. | 4 and 43 |
| Harvey Spring & Forging Co.. | 53 | V | |
| Haywood Tire & Equipment | — | Vanderpool Vulcanizing Co.... | 72 |
| Co. | 78 | W | |
| Helser Special Tool Co. | 72 | Wagner Specialty Co. | 75 |
| Hinckley Machine Works. | — | Warshawsky & Co. | 74 |
| Hobart Bros. | 72 | Waxit Mfg. Co. | 66 |
| Holmes & Bros., Inc., Robert.. | 70 | Webber & Co., P. H. | — |
| Howell Co., The W. H. | 73 | Weston Electrical Instrument | — |
| I | | Co. | 73 |
| Inland Machine Works. | — | Wood & Safford Machine Wks. | — |
| Inside Front Cover | — | Z | |
| J | | Zinke Co. | 69 and 71 |
| Jackson Compressor Co. | 67 | | |
| Jenkins Vulcan Spring Co. | 35 | | |
| Jewel Electrical Instrument | — | | |
| Co. | — | | |

| NAME | POSITION | SALARY |
|------|---------------------|--------------|
| John | AUTOMOBILE ENGINEER | \$125 A WEEK |
| | REPAIR MAN | \$50 A WEEK |
| | CHAUFFEUR | \$30 A WEEK |

Put Your Name On This Pay-Roll

Men like you are wanted for big-pay positions in the fascinating field of automobile engineering. We have made it easy for you to fit yourself for one of these positions. You don't have to go to school. You don't have to serve an apprenticeship. Fifteen automobile engineers and specialists have compiled a spare time reading course that will equip you to be an automobile expert without taking any time from your present work.

AUTO BOOKS

6 Volumes Shipped Free

Now ready for you—an up-to-the-minute six-volume library on Automobile Engineering, covering the construction, care and repair of pleasure cars, motor trucks and motorcycles. Brimming over with advanced information on Lighting Systems, Garage Design and Equipment, Welding and other repair methods. Contains everything that a mechanic or an engineer or a motorcyclist or the owner or prospective owner of a motor car ought to know. Written in simple language that anybody can understand. Tastefully bound in American Morocco, flexible covers, gold stamped, 2600 pages and 2000 illustrations, tables and explanatory diagrams. A library that cost thousands of dollars to compile, but that comes to you free for 7 days' examination.

Only 7c a Day advance. First you see the books in your own home or shop. Just mail coupon and pay express charges when books arrive. You can read them and study them for seven whole days before you decide whether you want to keep them or not. If you like the books send only \$2 in seven days and \$2 a month until the special introductory price of \$19.80 has been paid. (Regular price \$30.00.) Along with the set goes a year's consulting membership in the American Technical Society. (Regular price \$12.) This great bargain offer must soon be withdrawn.

Send No Money Now

Don't take our word for it. See the books without cost. There is so much profit in this offer for you that we urge you to waste not a moment in sending for the books. Put the coupon in the mails today. Send no money—just the coupon.

American Technical Society Dept. A-777, Chicago, Ill.



Mail The
Coupon For
These Books

American Technical Society,
Dept. A-777, Chicago, Ill.

Please send me the 6-volume set, Automobile Engineering, for 7 days' examination, shipping charges collect. If I decide to buy I will send \$2 within 7 days and the balance at \$2 a month until the \$19.80 has been paid. Then you send me a receipt showing that the \$30.00 set of books and the \$12 Consulting Membership are mine and fully paid for. If I think I can get along without the books after the seven days' trial I will return them at your expense.

Name
Address
Reference

MAKE BIG MONEY REMILING TIRES

Write today for the facts

Miller

AD-ON-A-TIRE

The only perfected tire remiler

The Miller Rubber Company

Dept. A231

AKRON, OHIO

Makers also of Miller Uniform Geared-to-the Road Tires and Red and Gray Inner Tubes—Team-Mates of Uniform Tires.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

HAYWOOD'S LATEST INVENTION



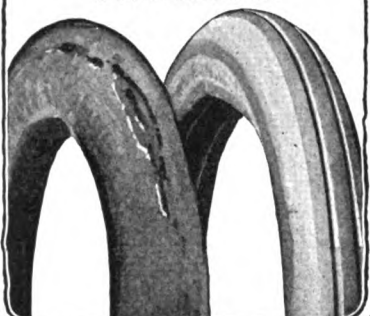
Here it is:

A new machine that will earn from \$100.00 to \$150.00 per week in any well-established tire repair shop. More than one year of constant experimenting and development work was required to complete it.

Statistics say there will be **One Billion Dollars'** worth of tires worn out this year. The insistent demand for re-treaded tires that would add 3,000 to 4,000 more miles of wear is growing. A new and better machine than had so far been produced was needed.

HAYWOOD'S
Silvur Lined
MOLD

Two actual photographs
of One Tire
BEFORE and AFTER
being repaired and retreaded on
a silvur-lined mold.



meets the need. Made of white metal—die cast—absolutely free from blemishes and smooth as glass. It is truly a wonderful machine.

Old tires retreaded on this machine closely imitate the runner, **cord type**, and are smooth, classy, bright. All 4,000 owners of Haywood Tire Repair plants will **want** this new Haywood invention. Owners of other plants should have one.

**PAYS FOR ITSELF
IN A WEEK**

Will earn from \$100.00 to \$150.00 weekly. Are you an auto tire repairman? If you are not, why not enter this profitable business? Tire repairmen earn **\$2,500 to \$4,000 per year**. Many are doing better; some up to \$6,000 and \$7,000 per year. If you have a tire repair shop you need this Haywood Silvur-Lined Retread Mold. You should write us at once and get the details. It will pay for itself in a week. Every week thereafter you should make \$100.00 or more extra profit.

FREE BOOK

It tells about automobile tires—it gives inside facts that you should know about profits. When you write tell me if you have a tire repair shop, or, if you want facts about the tire repair business. Address

I have an interesting book to send you that tells about tire repairmen and the Haywood method.

WRITE ME!

I will tell you how to start in business as an expert tire repairman and earn \$2,500 to \$4,000 per year. Sounds too good to be true. But it is true, every word of it.

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., INDIANAPOLIS, IND.

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., Indianapolis, Ind.
(Mark an X for interest in either or both subjects)

- ☐ Send facts about the Silvur-Lined Mold.
☐ Send facts about the Tire Repair business.

NAME

ADDRESS

**SILVUR
LINED
RETREAD
MOLD**



N. E. Gibbard, Charlotte, Mich., owner of a Haywood plant, last year did a business of \$15,000. Charlotte is a town of 7,500 population.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

FACILITIES FOR QUICK DELIVERY ON CHAMPIONS

READ THESE SPECIAL FEATURES

Values: Mushroom Type housed in bronze cages. Special arrangement for re-grinding.

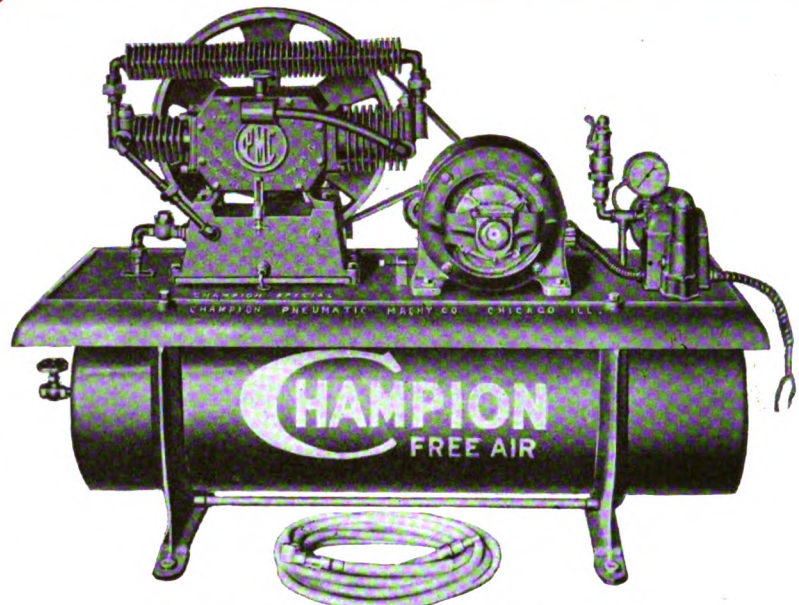
Crank Shaft: Drop forged. $1\frac{1}{8}$ inches in diameter.

Connecting Rod Bearing: $1\frac{1}{8} \times 1\frac{1}{8}$ inches, bronze back, babbitt lined.

Main Bearings: Hess-Bright ball bearing.

Connecting Rod: I-beam type with inserted wrist pin bushing.

Lubrication: Automatic splash insures perfect lubrication.



THE CHAMPION SPECIAL AUTOMATIC AIR UNIT

The Most Efficient and Long-Lived Air Compressor ever built

OUTFIT INCLUDES: Self Oiling Compressor, capacity 4 cu. ft. of air per minute complete with large filtering trap, check valve and safety valve; all mounted on a substantial base, with electric motor for any current, belt and automatic belt tightener; automatic controller, non-leak check valve, 32 gallon tank, air pressure gauge, needle point air valve and fittings; 25 ft. of high grade armored air hose and automatic air valve.

Outfits are equipped with our patented automatic pressure release which releases the oil and water from the base of the pump automatically, also permits the motor from starting against no pressure which eliminates the cause of burned out motors, fuses, etc.

The tank regularly furnished on this outfit is tested for 250 lbs. working pressure.

Champion Air Compressors are ready for prompt delivery. Write to-day for full information and prices.

The Champion Pneumatic Machinery Co.

1402 S. Michigan Ave.

CHICAGO, ILL.



Hasn't This Oplex Sign an Established, Dependable Look

Oplex Signs have an atmosphere which suggests the business that is long established, dependable. You would never connect an Oplex Sign with a fly-by-night. When you see an Oplex Sign you reason that the owner intended it to be there a long time, and so he bought the best. You find Oplex Signs on such permanent businesses as banks and leading hotels.

Raised, snow-white glass letters on a dark background---that's what Oplex Signs are, plus distinctive design, plus advertising thought. Strongest possible display both day and night. No other signs have that distinctive appearance.

Garage men and auto dealers are getting good returns from Oplex Signs. Trade-marks can be perfectly reproduced in the raised, Oplex characters.

A letter will bring you full information, including a sketch showing how your Oplex Sign will look.

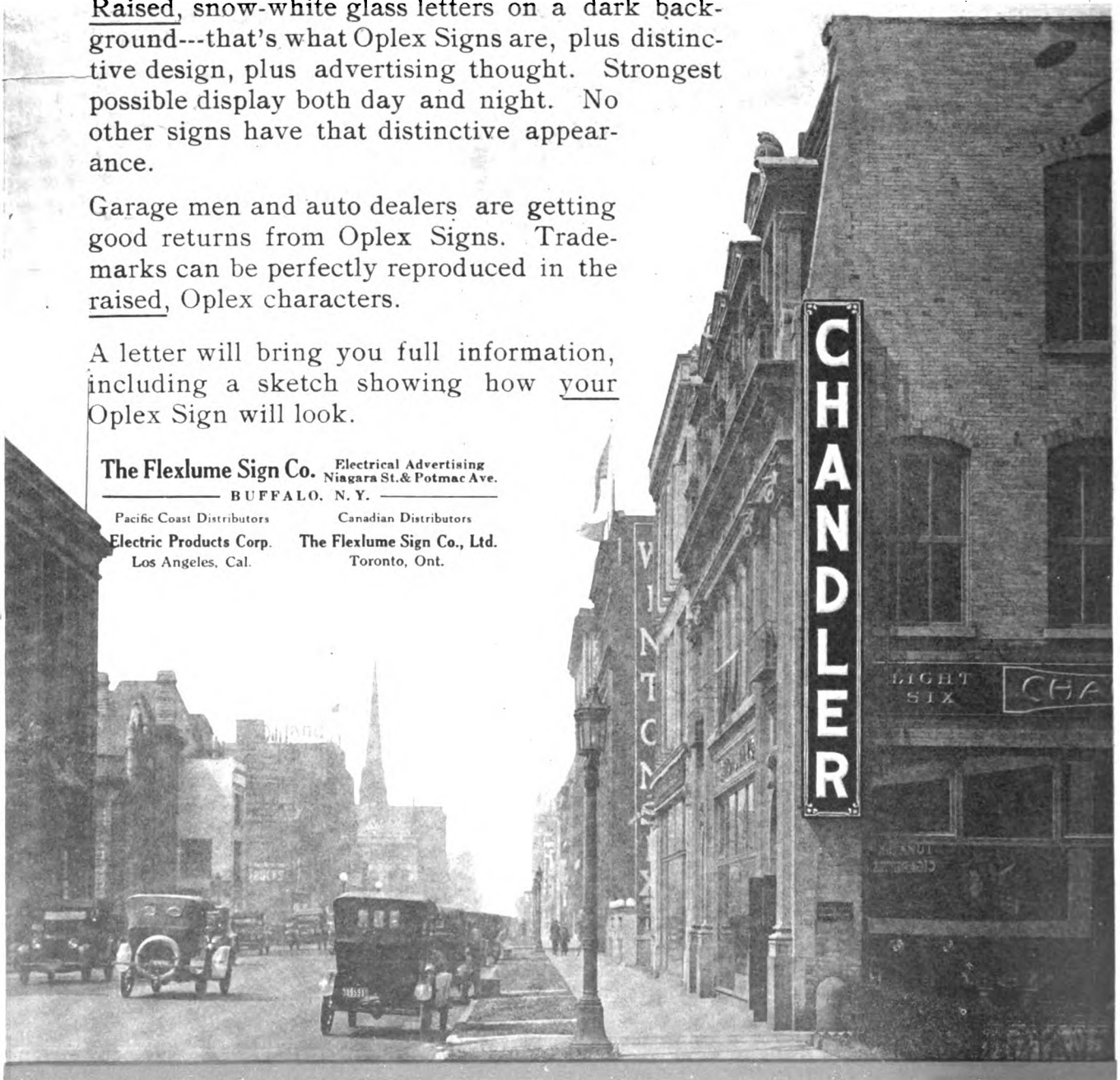
The Flexlume Sign Co. Electrical Advertising
Niagara St. & Potmac Ave.
BUFFALO, N. Y.

Pacific Coast Distributors

Canadian Distributors

Electric Products Corp.
Los Angeles, Cal.

The Flexlume Sign Co., Ltd.
Toronto, Ont.

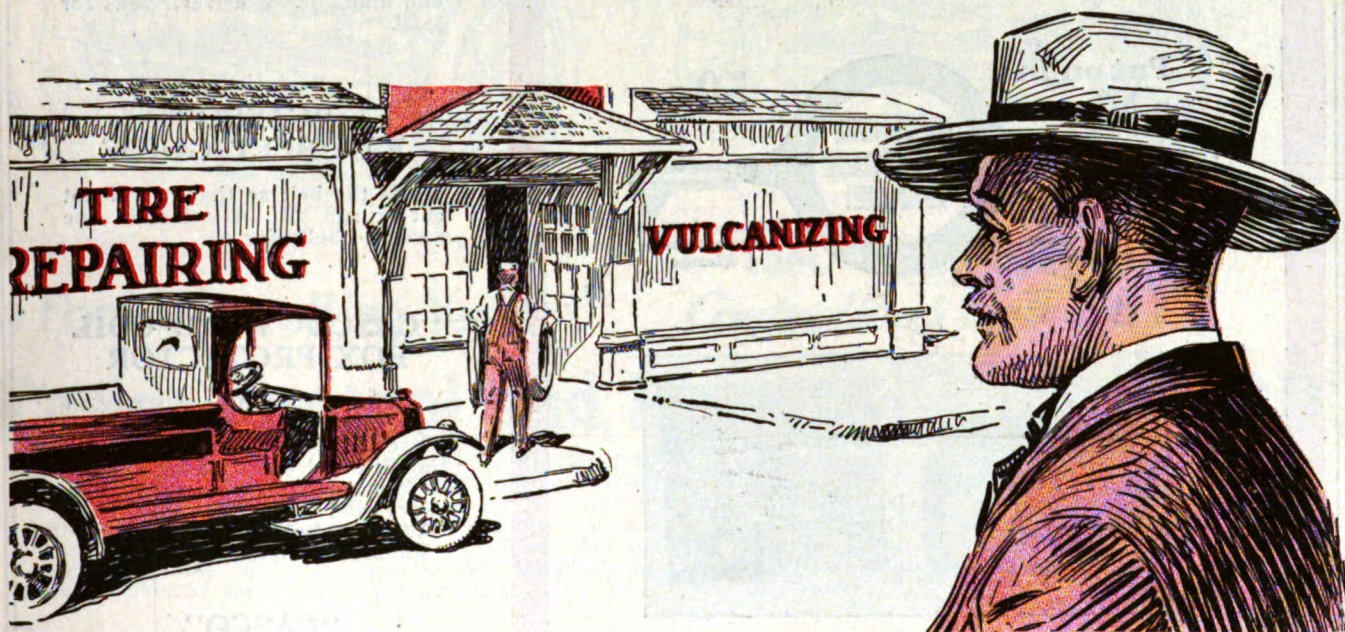


American Garage & Auto Dealer

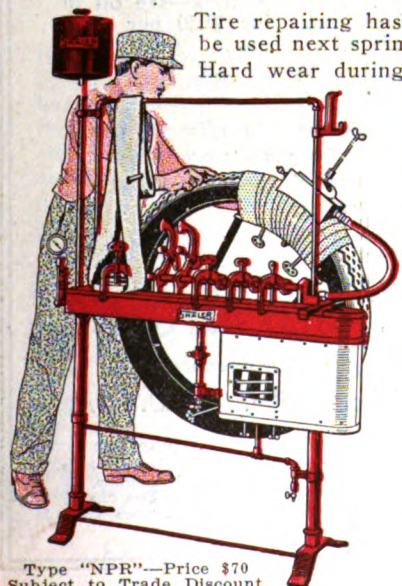
Published Monthly
116 So. Michigan Ave.
CHICAGO, ILL.

NOVEMBER 1919

Vol. 10—No. 11
10 Cents the Copy
\$1.00 Per Year



Make Big Profits DURING THE WINTER MONTHS



Type "NPR"—Price \$70
Subject to Trade Discount

Tire repairing has no dull season—millions of tires must be repaired this winter before they can be used next spring.

Hard wear during winter and extreme cold have a detrimental effect on tires—they need greater care—more careful attention and frequent repairing.

A few feet of space in any spare corner devoted to vulcanizing will bring in enough money to pay all your overhead—and even more.

SHALER Shop Vulcanizer

is the most practical vulcanizer made for garages and tire repair shops. Complete outfit, vulcanizer, tools and repair material cost less than \$100—and this vulcanizer will do just as much work—and as good work—as machines that cost five or six times as much.

Large capacity—you can mend 12 casings and 200 tubes in one day. Uses Wrapped-Tread method used by large tire manufacturers. Automatic Heat Control saves time and trouble—prevents damaging tires.

ORDER FROM YOUR JOBBER

Place your order with him now—or write him for full information about the SHALER Type NPR Vulcanizer. Write us quick for catalog of the complete line of SHALER Vulcanizers for Tire Repair Shops, Garages and Motorists' Use.

C. A. SHALER CO., 350 Fourth St., Waupun, Wis.

Oldest and Largest Manufacturers of Vulcanizers in the World

CASCO Products for FORD CARS



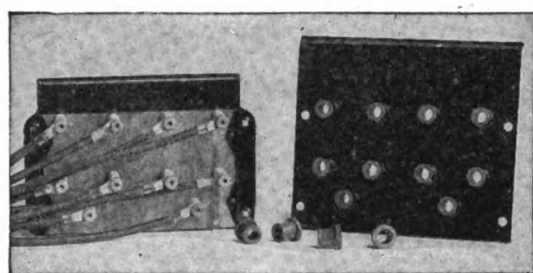
\$5.00

"Hold 'Em in the Road" for Ford Cars

**Put on in
a Minute**



50c.



"CASCO" FORD COIL BOX PROTECTOR

A device that many are trying to copy. Be sure to get the genuine "Casco." Over 200,000 in use. Handled and endorsed by jobbers in 48 states. Protects coils from injury and dampness.

Without Rubber, \$1.00.
Rubber Insulated, \$1.50.

"CASCO" OIL DRAIN COCK

The automatic, spring steel, ball seat, oil drain cock. In a class of its own. No cock-wrench—no "get under"—no loss—no leak—no worry. Pull the hook—see oil in engine. Sells for \$1.50 per pair complete.

*Those who offer for sale
infringements are liable as
manufacturers of infringe-
ments.*



DEALERS

**"Casco" Specialties are
big sellers among Ford owners.
Write for particulars and trade
prices.**

**"Casco" Products are handled
by all Chicago Jobbers.**

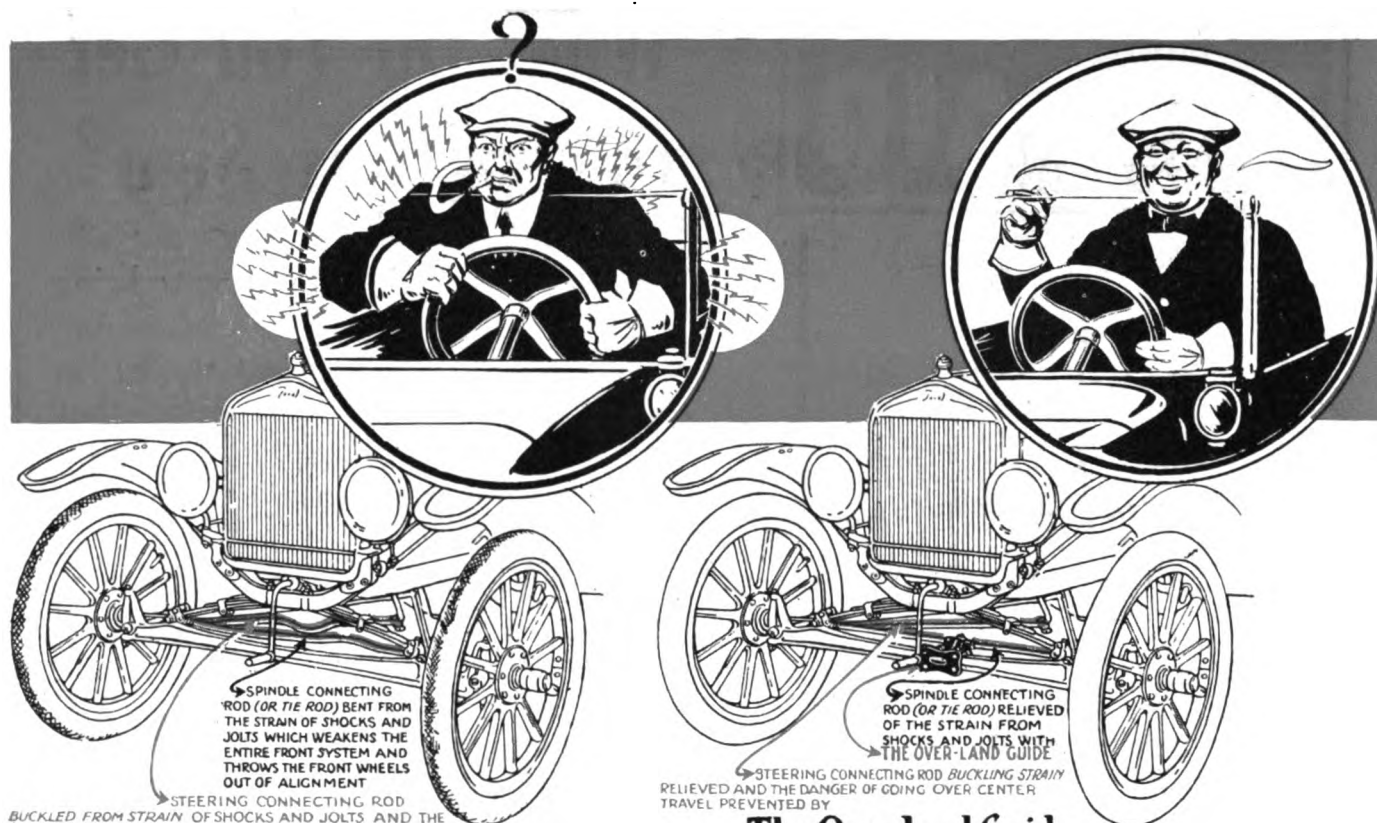
CASCO MFG. CO.

Manufacturers

Thomasville, Ga., U. S. A.

EXPORTER
Chas. F. Lyngas
46 W. Broadway
New York City
Latin and Mexican

EXPORTERS
Muller, MacLean & Co.
11 Broadway
New York City
English



A Ford Controlling Itself

The Over-land Guide
PATENTED
Controlling the Ford.

Easier control and longer life for FORDS

SOMETHING more than the standard steering mechanism of a Ford car is needed to enable the driver to keep the car in the road without constant nerve-wearing effort. There are hundreds of thousands of everyday illustrations. Just pause on some corner and watch the Fords pass—observe how they wobble back and forth when they hit a bump or crease in the road. Note how the front wheels wobble and scoot, wearing out the tires and subjecting the entire front system and steering mechanism to a strain that results in worn-out parts and repair bills. Bear in mind also the danger of the steering connecting rod going over center travel from turning corners or short turns—the consequent loss of control, frequently causing accidents and serious damage.

Every Ford should be equipped with an OVER-LAND GUIDE

because it is Life Insurance for Fords and Ford owners

It overcomes the difficulties in steering the Ford, and keeps the car in place. Also removes the strain from the steering mechanism, as well as from the arms and shoulders of the driver.

When a Ford is equipped with an OVER-LAND GUIDE,

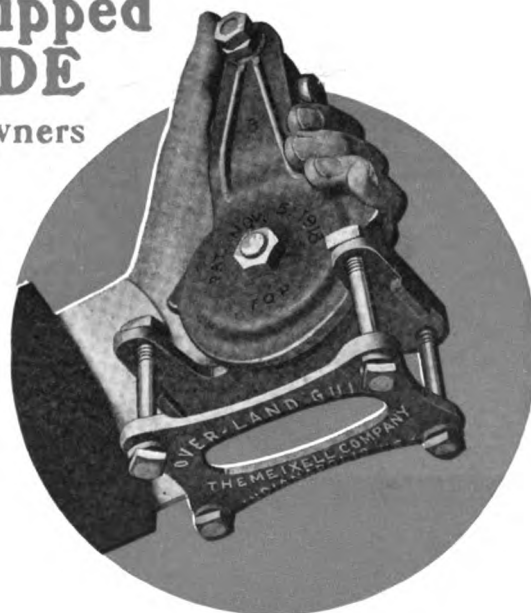
THIS BROAD GUARANTEE PROTECTS YOUR CUSTOMER

The OVER-LAND GUIDE, properly installed, is guaranteed to do all we say. Your customers can use it for twenty days, and if at the end of that time they are not satisfied, money will be refunded upon its return.

any driver can guide the wheel with the tips of his fingers, while the car is in motion over the roughest roads without the danger of losing control.

Saves at least ten times its cost in one year in repairs alone where the Ford or Ford truck is used constantly.

It must be apparent to you that the OVER-LAND GUIDE is a real "Safety First" device, besides of necessity for every FORD CAR or FORD TRUCK. Sales are limited only by the number of FORDS now in service, or to be made. You have never had a more meritorious accessory to sell! Our "Liberal profit plan" will interest you. **WIRE OR WRITE IMMEDIATELY FOR DEALER PARTICULARS!**

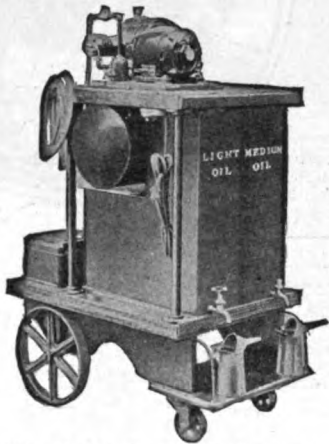


THE MEIXELL COMPANY

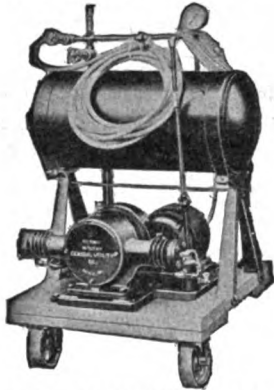
Office---216 Board of Trade Building
INDIANAPOLIS, IND.

The OVER-LAND GUIDE bolts to the center of the front axle and the center of the spindle connecting rod (or tie rod) securely relieving the vibration and strain in the spindle connecting rod (or tie rod) and entire front system, and the steering mechanism up to the steering wheel.

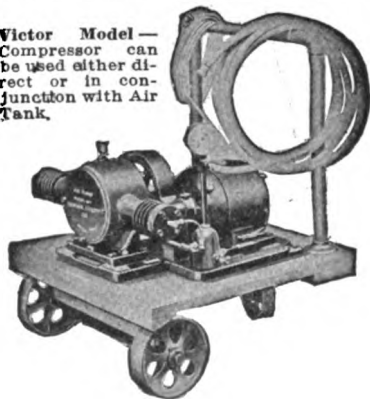
FREE AIR



Utility Model—Combined air compressor, air tank and oil service. It makes your air service a direct profit maker by reminding the motorist of his need of oil.



Direct Portable Model—Pumps cool air direct into tire. Consists of compressor with direct drive $\frac{1}{2}$ H.P., ball bearing equipped motor on portable truck.



Victor Model—Compressor can be used either direct or in conjunction with Air Tank.

What Do You Get Out of this Sign?

Your "Free Air" sign is meant to bring you business. For to give you maximum returns, it must be backed up by an efficient service. And by a service that does not eat up its money-making value, in current and maintenance cost.

The **General** line of our compressors give you just what you need to get—real results out of your "Free Air" service: An outfit that will exactly suit your needs; a highly efficient compressor that delivers 5000 cu. in. of air per minute, at an unusually low current cost, and an equipment, including a $\frac{1}{2}$ h.p. GE ball bearing equipped, direct connected motor, that will give long trouble-free service, costing you little enough for upkeep.

Two Cylinder GENERAL AIR COMPRESSORS

Write for our booklet, "The Low Cost of Cool Air," and get acquainted with our line.

We sell through exclusive Distributors only. Immediate deliveries.

UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

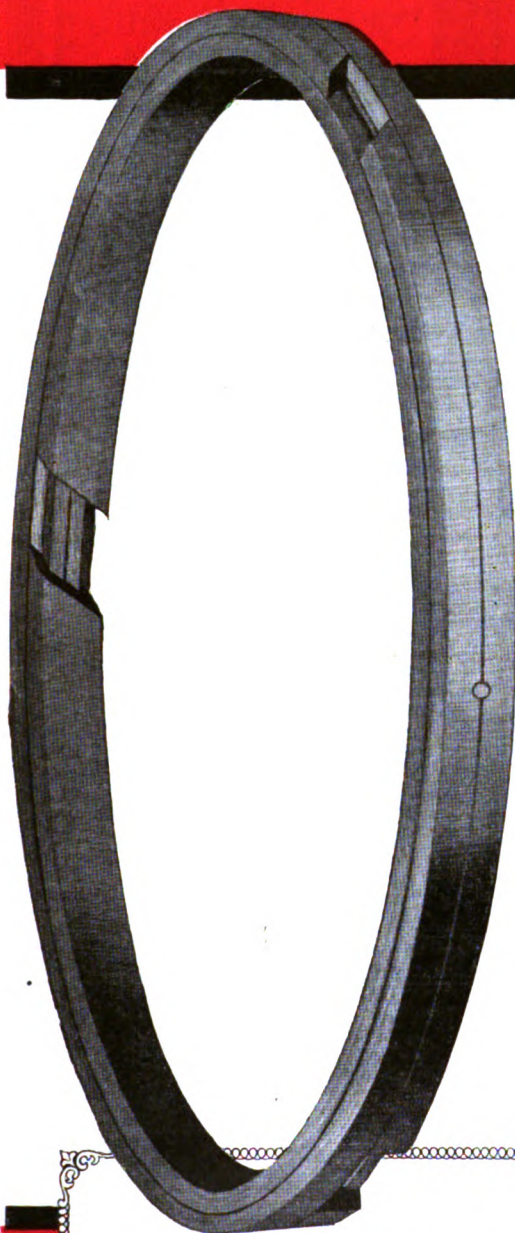
Factory 1324 Ogden St. Philadelphia - Office 809 New Stock Exchange Bldg., Philadelphia

Utilities that Sell Because They Serve

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

ZELNICKER *Ever-Tyte* The Piston Ring for All Engines

**More Power on Less Fuel—
Guaranteed**



No other Piston Ring carries such a guarantee. Printed below is an agreement—its terms are wide and complete. Owners of automobiles, farm machinery and other makes of engines know its significance. Read it NOW—every word!

With ZELNICKER *Ever Tyte* Piston Rings you get maximum power from minimum fuel and oil. Its six point circular expansion makes absolute all-'round contact with the cylinder wall. By means of Zelnicker's Patented Right Angle Interlock, three piston rings are combined into one.

Its operation is unfailing because its principle is true.

Result: You get decreased friction and more power.

Every fraction of power from every explosion is conserved.

Get this: Over 17,579,284 readers will see the message about ZELNICKER *Ever Tyte* Piston Rings in the following high-class publications:

Saturday Evening Post
Literary Digest
Progressive Farmer
Successful Farming
Country Gentleman
Sunset Magazine

When this campaign sweeps the country will you be ready to respond? Order now—a call may come tomorrow. "Prepare."

Satisfied customers and bigger profits for you. Write for our proposition.

THE EVER TIGHT PISTON RING COMPANY
SAINT LOUIS, MO.



We guarantee ZELNICKER *Ever Tyte* Piston Rings to produce higher compression, develop more power, and use less fuel and lubricating oil, you to be the sole judge.

We will refund the full purchase price to any purchaser upon the return of the rings if they fail to give absolute satisfaction within a period of twelve months from date of installation.

THE EVER TIGHT PISTON RING CO. ST. LOUIS

No 2,628,242

M. Zelnicker
PRES.

**Read
The Guaranty Bond**

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

"NORMA" PRECISION BALL BEARINGS

(PATENTED)



The "one-hoss shay" — one time only an inspiration to a poet — today typifies the ideal which builders of cars, trucks, tractors and power boats are striving to realize. To create an automotive unit of uniform time-and-wear-resisting capacity in every part — one that, when it fails, will fail "all at once and nothing first" — this is the goal toward which builders are striving.

It is a significant fact that the longest-lived automotive units are those carrying "NORMA" equipped magnetos and lighting generators. And it is a matter of record that "NORMA" equipped electrical apparatus often outlasts the usefulness of the machine that carries it.

**Be Sure — See That Your
Electrical Apparatus
Is "NORMA" Equipped**



THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings

American Garage & Auto Dealer

Published Monthly

TABLE OF CONTENTS

EDITORIAL

| | |
|--------------------------------------|----|
| Railroads and Motor Trucks..... | 9 |
| Motor Theft Bill Now Law..... | 9 |
| Production Will Lower Costs..... | 11 |
| Accessories for Christmas Gifts..... | 11 |

GENERAL

| | |
|---|-------|
| The Mail Order Houses and Your Sales, by Frank Farrington | 12-14 |
| What the Other Fellow Is Doing, by Arthur S. Ballard | 14-15 |
| Taking an Inventory of Your Stock, by J. Newton Boddy | 17 |
| The Layout of a Modern Garage, by Howard L. Manning | 18-19 |
| Truck Routes and Garage Owners, by H. T. Dobbins | 20-22 |
| Centering and the Square Center, by J. N. Bagley.. | 26-27 |
| The Law on Emergency Accidents, by Chesla C. Sherlock | 32 |
| Timely Cold Weather Precautions..... | 34-36 |
| Tentative Chart of Accounts Set Up, by J. Newton Boddy | 44-46 |

DEPARTMENTS

| | |
|---|-------|
| Practical Hints for Shop Mechanics, by E. C. Pohlmann | 23-25 |
| Readers' Questions and Answers, by E. C. Pohlmann | 28-31 |
| Welding, Cutting, and Brazing Practice, by David Baxter | 38-42 |
| How to Make the Show Profitable, by E. B. Hinrichsen | 48 |
| Facts and Ideas for the Tire Dealer..... | 50 |
| From the Truck and Trailer Field..... | 52-54 |
| Accessories—They Bring In Money..... | 56-58 |
| Garage Equipment for Better Efficiency..... | 60 |
| News of Manufacturers and Jobbers..... | 62-66 |
| Buyers' Reference | 76 |
| Index to Advertisers..... | 77 |

Published on the 15th of each month by the
AMERICAN GARAGE & AUTO DEALER, Inc.
116 S. Michigan Avenue, Chicago, Ill.

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3½-ton Denby used by Redmond Pine Mill Company, Redmond, Oregon, in hauling from mill to yard—20 miles, through heavy sand and over bad grades.



Denby trucks have found a very wide use in Central and Eastern Oregon, because of their dependability and the ease with which they negotiate bad roads.



DENBY

MOTOR TRUCKS

DEALERS!

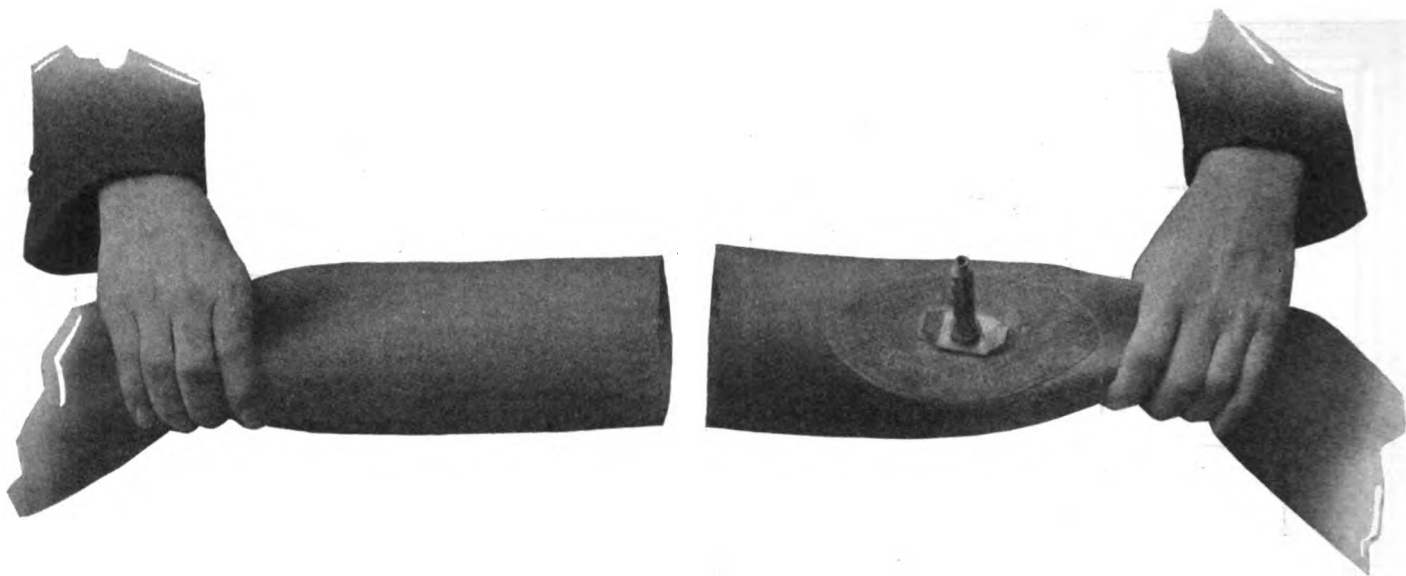
There are big opportunities in merchandising Denby trucks; maybe there's some open territory in your section. A letter to the factory will post you.

The popularity of Denby trucks in the lumber industry in the North West, is the result of their ability to handle, easily and profitably, work that is impossible for most trucks.

This super-ability, characteristic of all Denbys, is your assurance that a Denby will do any task you may demand of it; and that it will do all kinds of work with perfect dependability.

Denby Motor Truck Company, Detroit

(54)



Give TIRE-DOH the hardest sort of test and it immediately proves its adaptability



The Genuine TIRE-DOH Outfit consists of One Can TIRE-DOH and One Can TIRE-DOH Cement. Two sizes — 50c and \$1.00. TIRE-DOH repairs anything that is Rubber

You can take a tube which has been cut in two, and unite the pieces with TIRE-DOH so that it is as good or stronger than before, making a repair that will outlive the tube.

Where rubber is concerned — and this applies to rubber boots, hot water bottles, rain coats, etc. — besides tubes and casings, there is no tear or cut which TIRE-DOH cannot mend satisfactorily or make like new.

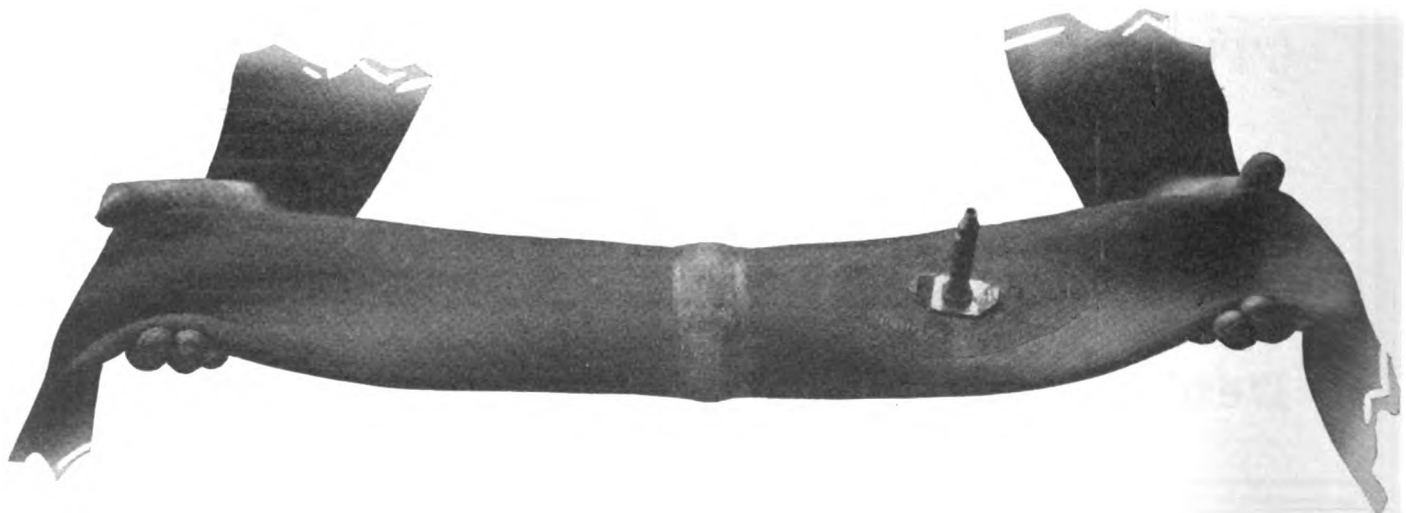
For this reason TIRE-DOH is known to be the universal tire repair outfit. Sell your customers TIRE-DOH because it will give them the most satisfaction and economy. Sell TIRE-DOH because there's a liberal profit on every sale for you.

Our proposition will interest you.

Atlas Auto Supply Company

680 W. Austin Avenue

CHICAGO



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

American Garage & Auto Dealer

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

Vol. X. No. 11

CHICAGO

November, 1919

Railroads and Motor Trucks.

"If railroad traffic were anywhere near up to normal, it would require four and a half billion dollars to supply a sufficient number of new cars and other equipment to handle the traffic satisfactorily." The speaker of the words was a man who for years has been intimately associated with the railroad industry and is in a position to speak authoritatively as regards the present situation.

Think of it! Four and one-half billion dollars required to place the railroads on a basis to satisfactorily handle the railroad traffic if it were of a normal amount—but it is much below normal and the entire country has just been experiencing a shortage of sugar because of the alleged inability of the railroad administration to supply cars for transporting it to the parts of the country where the shortages are most acute.

Is it any wonder that under these conditions the long-suffering shippers and consumers have turned to the motor truck for relief from the many delays and high rates, particularly for the so-called "short hauls." All over the country motor trucks are being utilized for transporting freight, both perishable and otherwise, and even live stock.

Motor truck routes radiate from the large centers and round trips of

even as much as 150 miles are made. In fact, only recently because of a railway express employees' strike in New York City, tons of grapes and pears, particularly the former, accumulated at Clintondale, N. Y., and

Be a Booster!

**Boost your city, boost your friend,
Boost the lodge that you attend,
Boost the street on which you're dwelling,
Boost the goods that you are selling.**

**Boost the people round about you,
They can get along without you,
But success will quicker find them
If they know that you're behind them.**

**Boost for every forward movement,
Boost for every new improvement,
Boost the man for whom you labor,
Boost the stranger and the neighbor.**

**Cease to be a chronic knocker.
Cease to be a progress blocker,
If you'd make your city better,
Boost it to the final letter.**

many farmers were faced with serious loss unless their products could be rapidly moved to the consumption centers.

Arrangements were made to bring this fruit to New York City by motor trucks of eight-tons' capacity. For two weeks the round trip of 150 miles was accomplished daily in 18 hours and at a cost of approximately that of railroad express rates. Had a

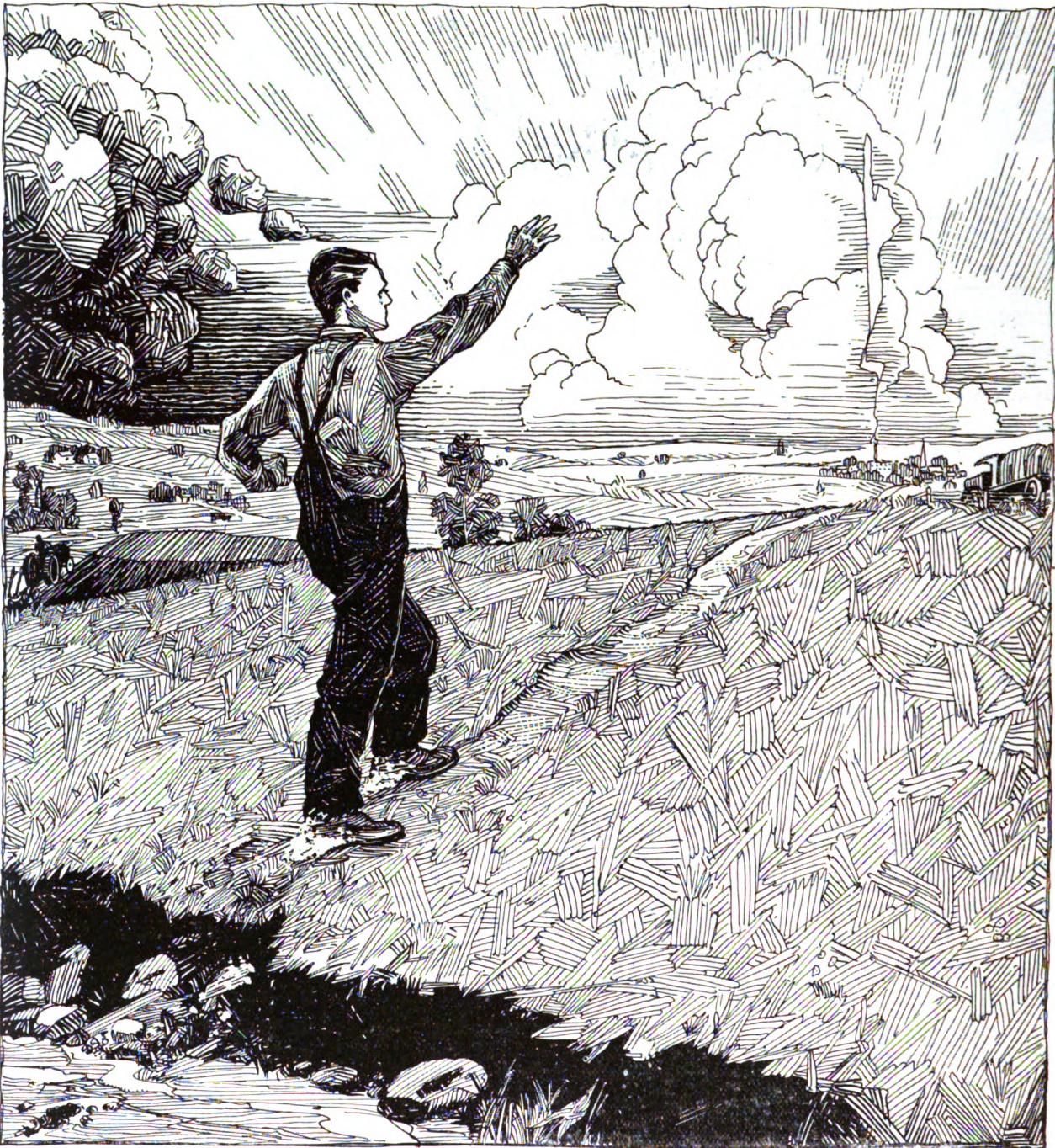
back-haul been developed, the costs would have been far under that of railroad express charges.

The back-haul business is gradually being developed by the motor-truck operating lines, particularly in those sections where the many advantages of motor-truck shipping are recognized. The element of time is greatly reduced, labor in handling and crating is economized and damage in transit is minimized in short-haul motor truck shipments. These are only a few of the savings.

Think of it! How many motor truck routes could be established and equipped for four and one-half billion dollars? Freight would be much more efficiently handled and at much less cost. It looks as if the day of the motor-truck express has arrived. We're glad to see the tendencies toward the more extensive use of motor trucks for freight and express shipping. Increased use of automotive equipment means increased business for the automotive dealer and garageman.

Dyer Bill Now a Law.

Congress has recognized that the theft of automobiles is a matter of national concern. It has passed the Dyer bill, known as the National Motor Vehicle Theft Act. Although the President failed to sign it on account



Our Face Is to the Future

TRULY we have cause for thankfulness as Thanksgiving Day approaches. A year ago the Great Conflict had just ended, and we were on the verge of a great readjustment period. Under extraordinary difficulties many steps have been taken along the path of readjustment.

We are a nation with our face to the future—and that future will be molded by real Americans, not foreign or native-born agitators. So with our feet on the firm ground of conservatism and loyalty, we thankfully, hopefully and determinedly face the rising sun of the future.

of his illness, the act became operative October 24, and now there is a real difficulty placed in the way of the gentry who have done such a thriving business in stealing cars and sending them to other states for disposal at prices much below their value.

The next step, of course, is the enforcement of this law. To this end the National Automobile Dealers' Association, which successfully fostered the bill that is now a law, is arranging that wide publicity be given the new law so that prompt action will be taken whenever there is opportunity for making a case. In the enforcement of the law the garagemen and automotive dealers can be of great assistance. Familiarity with the provisions of the act places them in a position to give "First-Aid" advice to car owners whose motors may be stolen and also to take proper action in regard to any car which may come into their care and which they may have reason to suspect has been stolen.

The National Automobile Dealers' Association, in spite of many difficulties, was successful in getting Congress to take favorable action on the bill which it promoted. It is to be congratulated upon the successful outcome.

Production and High Living Costs.

The prospect of every American having a fair share of the things necessary to sustain life and make it worth living, depends in part upon the speed and quantity in which these things are produced. If we were able for a certain length of time to devote the whole of our productive powers to making useful things and nothing else, their cost would be reduced, in spite of the activities and plans of the profiteers, to a price which would enable all of us to have all we need.

It is obvious that the wage earners

make up the chief market to which producers must look to dispose of goods produced. In the main, it is necessary that we produce for ourselves and for others such things as are required, as food, clothing and shelter. If a sufficiency of these goods was produced, their prices would fall to a level where all might obtain what their needs demanded.

The cheaper these things become, the less they take up of the wages of the workers, the more money is freed for the purchase of other things and a demand is created for fresh com-

Remember that it is about **FOUR TIMES AS EASY** to sell through a demonstration to the eye, as through a wordy argument which enters in only at the ear gate. That's why the "Before and After" pictures are so effective; why exhibitions and displays are money-makers; why pictures, cartoons and even crude illustrations sell goods. They actually **SHOW** just what the salesman is trying to say. It is often easier to convince by an object which actually gives the points you are trying to make, physical form, than to describe that point and keep asking: "Do you understand? Do I make myself clear?"

modities. This demand furnishes further employment and additional wages. So the cycle continues to revolve indefinitely around production. By increasing production the cost of living is decreased but employment is increased and money is freed to command less necessary things.

If we do not adopt every means of increasing output, if we do not abolish waste and cut down unnecessary expenditure, we must gradually impoverish ourselves as a nation. Unless we give a larger share of our national effort to production of necessities and save on luxuries that more capital may be released for plants and machinery for further production, conditions will be produced which will

tend to lower the general standard of life of the wage earners in spite of higher nominal wages.

But if we are prepared to work hard, spend wisely, save regularly, cut down waste and extravagance, and invest carefully, shorter working hours will become possible, wages will be really and not nominally higher and prosperity will be our national portion.

Accessories for Christmas Gifts.

Christmas is not so very far away. From now on many business men will make special efforts to attract the so-called Christmas trade by means of suggestions and displays calculated to instill the thought of Christmas gifts in the minds of prospective purchasers. Some merchants began their Christmas displays early this month.

This year the Christmas trade is expected to be greater than it has been for many years. Automotive dealers should, and undoubtedly will, capture a considerable share of this.

There is no reason why they should not and there is every reason why they should, for the range of prices of the goods that can be disposed of at this season is an exceptionally wide one. In fact, there are but few lines of business which can attract to as great a degree the small purchaser and also the large purchaser, from the supplying of low-priced accessories to the car suited to the most fastidious taste and well-filled purse.

The automotive dealer has such a variety of things suitable for Christmas gifts that the business of the closing months of the year should be a satisfactory one. In view of the scarcity of cars to supply the demand, the dealers in many instances will have to concentrate on the sale of accessories to those who already are car owners. It's a short season and now is not too early to begin the campaign.

Mail Order Houses and Your Sales

Every Year the Mail-Order Houses Reap a Good Harvest of Profits on the Sales of Tires and Accessories—What Are You Doing to Prevent This?—Are You Going to Continue to Sit Back and Let These Sales Get by You?

By Frank Farrington

Thousands of dollars are going out of your territory every year, almost every month, to the mail-order houses for automobile supplies. What are you doing to prevent your customers buying in that way?

You may be doing a profitable business, but wouldn't you be glad to have that extra trade that is going out of town? You could handle a lot of it without any increase in your overhead expenses, without keeping any more help or paying any more rent, or light and heat bills.

It's a mighty hard proposition to get and hold this business that is going out by mail. The catalog houses are sending to every automobile owner in your territory catalogs of everything he uses, and the goods in these catalogs are priced low too. These catalogs come along about twice a year from each house, a thicker one for spring and a thinner one for winter. In them you see tires with a 5,000-mile guarantee, size 30x3½, priced at \$12.84 or thereabouts, and they state that guarantee in plain enough terms so that anybody can understand what it means. They say, for example, "If any of these tires shows defects under less than 5,000 miles travel, we will allow you the remaining mileage pro rata on the purchase of a new tire or we will return the equivalent in money."

That is the kind of competition you have to meet right in your town wherever it is. It is useless to claim that the mail-order catalogs are dishonest or that the houses behind them will not live up to their advertising. They have not built up their business in that way. Take it all in all, catalog competition is a pretty clean-cut sort of competition. It is certainly all open and above board. The cards are all on the table face up where you can see them.

It is a price competition because the only advantage the catalog house has over you lies in its claim that it sells

its goods for lower prices. You have every advantage with the local motorist except possibly that of price. Your advantages ought to offset the price advantage.

The big advantage the catalog house takes—not an advantage that it naturally has—is that of getting its advertising into the motorists' hands and asking them for their business

the man who is willing to go after it.

It is more trouble to write an order and get a money order and send to any of the large mail-order houses, but that trouble is reduced to a minimum by ready-prepared order blanks, addressed envelopes and even money-order application blanks ready to fill out. It takes time to get goods on a mail order too, and there are chances of loss of a shipment.

The customer usually figures the time—in advance—at just about the length required to get a letter to the catalog house and an answer back, and never thinks at all of a possibility of losing the shipment. Experience with delays and losses does not seem to teach the people that the same thing is likely to happen again. In fact, customers do not stop to think of all the advantages you offer and there is a great likelihood that you do not tell them often enough about them.

What are you going to do to get this business that is going away by mail from your own town? You are not going to say: "Well, I can't stop it. If folks insist upon sending away, they'll send." Nor will you say, as the oft-quoted blundering advertiser said, "Don't send out of town to be cheated, come to me."

The thing for you to do is to keep your stock and your line of supplies before the local motorists all the time. Keep them sold up so that a mail-order

catalog, coming along, does not find them in need of a number of things.

If you look after the tire business, for instance, of your people, you will see that they keep their cars well-tired, with a couple of spares always on hand. You interest them, by advertising and by personal solicitation, in your tires, and you show them the advantages of your best tires. The result is that they pay very little attention to a tire catalog because when they see it, they are not in need of tires and do not expect to be soon

The Echoing Cry!

Get out into the street—the center of the street—and shout for a solution of the retail mail order evil and back from the houses over the meadows will come the answer—an answer silent and unnoticed by those buying people—in the echoing cry, "Advertise."

After you have heard the answer will you still wait for that imaginary agency to sell your tires and accessories where the mail order houses are now reaping the harvest of their sowing? Will you still continue to sit by the roadside and wait for someone to come along and invite you to ride with him to bigger business, greater profits?

Advertising, not only private advertising, but personal and individual advertising, is the weapon that will make commerce worthless for the retail catalogue houses. Advertising that continually reminds your community that the very things they want you have—that the money they spend on mail order goods deprives the town of the profits that would help build up their community rather than that of a large city in which they are not interested.

It is such advertising that will make the future of retail mail order trade in your town a distant event of shadowy reality. The hope, the life, the fame, the success, the future of your business lies in that one magic word—advertise!

while you may be sitting back and waiting for them to come to you unasked.

You may have opened a garage, done no advertising at all; and you may be getting enough repair work to make a living. But the business in accessories and supplies is not going to come rolling your way unless you go after it. It is not to be expected that people will come and buy of you without being asked when they are being besought all the time to buy elsewhere. Most of the business goes to

If your customer sends for the convenient accessories he finds illustrated in the catalog, it is very likely because he does not know that you have them. You have never mentioned them or advertised them, or displayed them.

When they see them in the mail-order catalog, they are surprised and pleased to know that such things are to be had. For instance, a motorist, looking through the catalog sees that he can get extra cross chains for his Weed chains. You have them, of course, but you have never let him know it. He thinks he has found something new that hasn't struck the local garages yet and he decides to send. When he decides to send for one thing, he decides right away to see if there isn't something he can order with it to make enough for a shipment. And he's off! There goes an order for stuff you might have sold!

Perhaps you have said to yourself that it is foolish to advertise cross chains because if you keep quiet, the motorist will buy a full set of chains sooner or later. The trouble is that there are catalogs which do list cross chains. So get busy and advertise and display the cross chains and the repair links and chain repair tool and everything else that will be of interest to home motorists—and hold that trade in your own 'own.

You see something new mentioned in the advertising of some well-known maker of automobile accessories, but you don't make any effort to stock it because there is no call for it—and you don't think it will sell well and, anyway, you have enough accessories as it is. That may be all right from your own point of view, but the trouble is that you have to contend with a different line of thought on the part of both manufacturer and user.

The manufacturer is out to get that new item used. He is going to spend

the money that is necessary to put it into use. The motorist is looking for and is interested in new items. He is going to see the manufacturer's advertising and try to get the goods. He may come to you first as the most convenient source of supply, but owing to your attitude, he gets no satisfaction and no goods from you. Then along comes the advertising matter of some mail-order concern and in that he finds the new item he wants and there goes some of your business and you, yourself, are to blame.

It may be that you have so much

that does not prevent your losing the business on the new line that is developing in popularity.

The best kind of buying is that which looks toward the future, for it is wise to be prepared to give people what they want in the way of new things. Do not buy too much; buy just enough to satisfy your trade. As a matter of fact, meeting mail-order competition must begin with the buying end of your business. Try to buy some cheap items in small quantity just to be able to meet some seemingly attractive mail-order price.

Of course, you need to have the mail-order catalogs on file and you should make it a point to immediately send for a copy of each kind that comes into your territory. You cannot expect to meet mail-order competition without knowing what it is like.

Furthermore, you will find these mail-order catalogs a great help in making up your own advertisements. You will get an idea as to what experience and a careful study of the subject have shown to be the best things to say about goods in order to interest readers.

The garage manager who is an experienced advertisement writer is an exception. His work has not been along that line. If he wants to write a newspaper advertisement of a spotlight or searchlight, all he needs do is to get out the mail-order catalog and pick out the desirable things that are said in it about these lights and put these remarks into the advertisement

that he is going to writer.

If you have these catalogs, you are in a position to meet the competition. You can even tell your customers who say they are going to order by mail, that you will be glad to take their order on that same basis. It is better to take the customer's order at just what it would cost him to send it, and send it yourself, rather than not to handle his trade.

Penlings from the Pen of Dike

This year the crop reports are better than ever. Are you getting your share of the business? If not—"Use more Printers' Ink and make the buyers about you think."

A well-written advertisement shines up in a newspaper, just the same as a picture hat does in church on Easter Morning, everyone notices it.

Some people are bound to cuss you, but the merchant who never was cussed, never did anything.

The tourist travel has been larger this season than ever in history. Listen! Start planning this winter to make your garage a more comfortable place for the travelers, as they will sure be back more than ever next year.

I knew a merchant once who kept everlastingly at advertising TURNIP SEED—and soon all his competitors quit keeping Turnip Seed.

Read and think! Use Printers' Ink!

Smile a little every day, and it will keep the blues away.

Now is the time to push Winter Motoring Accessories. If you will show the merchandise that is suitable for winter motoring, you will never be worried about business being dull.

Lots of garage dealers make business dull in the winter months by talking about it being dull till finally everybody quits him, for his place is a "Dull" place. He made it so himself.

Push Motor Robes, Engine Robes, Covers and Winter Motor Goods—and push them good and strong.

And if you push them to beat the band, the winter will soon be gone.

You read in the Sunday papers who the leading Batters in the Big League are. Well, are you the Leading Batter in the Hometown Auto Dealer League? If not, why not?

You sell stuff to keep radiators from freezing up. Now is the time to push your business harder than ever to keep the cash register from freezing up.

stock on hand of certain accessories that you are opposed to stocking new and competing items, but that is not reason enough for neglecting to buy them. It is not a reason that satisfies either manufacturer or motorist. If you have bought too large a stock of one make of pump, or battery, or headlight lens, and are very anxious to get rid of it, you no doubt dislike to stock a new and competing line, but

It was a pretty wise tire dealer who bought a tire from each of three catalog houses who were making great inroads in his trade and kept those three tires right in stock, well-wrapped, just as they came from the catalog house. When a patron began to talk mail-order tires, he said: "I'll sell you those tires if you want them."

When the customer agreed to buy,

the dealer would bring out his tire ready to deliver. The customer would want to see it. "Oh, no, you pay for it and then it's yours and you can see it, but I sell it just as the mail-order houses do—sight unseen." Not very many customers took the tire. I think he did sell two or three.

The mail-order houses know that there is practically no limit to the

number of accessories that motorists will buy. They know that the more they push this business, the greater the sales. The dealer does not realize the possibilities to that extent. Why not make up your mind that there is a lot of this trade to be had right around you?

Go after it hard instead of letting it go to the mail-order houses.

What the Other Fellow Is Doing

Everyone Is Interested in Increasing the Volume of His Business—He Is Interested in Making More Money—A Summing Up of Some of the Successful Automotive Dealers' Everyday Methods of Getting Business

By Arthur S. Ballard

How can I increase the volume of my business? That is the one question with which we are all confronted from time to time. Every live dealer, from the fellow who has taken on the agency for a single accessory to the owner of the largest establishment in the state, wants to boost the volume of his business. We all want to make more money in order that we and our families may have more of the good things of life; more comforts and joys—and we desire success for the pleasure that comes from the knowledge of a task well done.

Sometimes we feel that the amount of business we are doing is not keeping pace with the effort we are putting forth. At other times we feel that we already have as much business as it is possible to get—that there is no more business to be had in the town—and we consider that we have reached the limit of our capacity.

When we have reached the point where we believe either condition to be true, we can usually rest assured that somewhere down the line there is a weak spot in our system which is standing in our way and hindering our progress. And we can be equally confident that somewhere is a solution of the problem; somewhere is a method that will point the way.

When we believe the effort we are putting forth is not justified by the volume of business we are doing, suppose we stop a minute and ask ourselves WHY? Or when we consider that we have all the business in the town, suppose we ask ourselves, "Is it true?" We will usually find precisely why our hard work is not bringing in the dollars, and that there is

more business in the territory that we have been overlooking.

One of the mighty important questions that the "Success" literature rarely attempts to answer is, "How are we to find these weak spots, and just what are we to do to remedy them after we have found them?" It is an easy matter to deal in generalities. We are fed upon them. But we seldom get any real, definite details.

Those details were the things that I went after. I started out by asking questions. I ended by using my eyes and digging things out for myself. I first asked a number of prominent and successful automotive dealers, whose names I will not use, what they considered were the things that had made them successful. The line of answers that I got made me think of my Sunday-school days and they closely resembled the Encyclopaedia of Proverbs.

Definite ideas in conducting the every day affairs of the dealer did not enter in their conversation. Some talked Honesty, some Service, some Hard Work, others talked Personality, Advertising, and other things.

So I went out to discover these details myself. I found out just what each fellow was doing. I compared it with what the other fellow was doing and I checked up on the things that they all were doing. Here they are. Perhaps you will be able to apply some of these things to your own business. Compare them with what you are doing and you may find some worth-while suggestions that will fit profitably in your system.

1. They were open to suggestion. Nearly every one of these concerns

welcomed suggestions. They were always ready to hear what their employees, friends or customers had to say about their business. They were constantly on the lookout for new ideas—anything that would tend to improve their service or increase sales.

Some of them even held weekly conferences with their employees. In these conferences, they would go over the past week's work, pick out the weak spots, and work out new sales ideas. They would carefully consider every suggestion, adopting the good ones and rejecting the impractical.

2. Sold advertised goods.

Their lines were largely composed of well-known products. The good will that the manufacturer had built up, they used as a wedge for creating good will between themselves and the buyer. They found that they could turn over advertised goods more rapidly, could overcome sales resistance, and were themselves reaping the benefits of manufacturers' advertising.

3. Their total expenses did not exceed one-fifth of their total sales.

4. They knew their communities' needs.

From their mailing lists they could ascertain the number of cars in the town and the surrounding territory and knew how to buy to meet the needs of these car owners.

5. Places were attractive.

In every store I found that the stock was clean, the displays attractive, and their stores arranged to give their customers the impression of a well-ordered and systematic business. Everything had a place, and everything was kept where any

man in the shop would know where to find what he might be looking for. This orderliness also gave them more storage space for cars and helped to reduce the overhead.

6. Prompt and easy adjustments of all complaints.

When a customer came in to make a complaint, he was received in as genial a manner as if he had come in to place an order. The customer usually was in an antagonistic frame of mind when he came in, because of an anticipated argument. The pleasant manner in which he was received would, in nine cases out of ten, lessen his antagonism.

As the dealer was handling advertised goods, he could make a quick adjustment, knowing that the factory would stand behind his action. If he knew the customer's demands to be unjust, he would pleasantly point out the reasons why his demands were unfair.

If the complaint were about an article that had broken, a good many of the dealers would repair the article, and put it in good operating condition. They valued the good will of their customers highly. Some of them sold everything on a money-back-if-not-satisfied basis. And they would refund the total amount of the sale at once if the article did not prove satisfactory to the user.

7. Broadened their territory.

By personal letters, mailing pieces,

advertising literature, they went after business in the surrounding territory. Some of them took on new lines and accessories that would be of special interest to the farmer and went after that business in an earnest way.

the names of all the car owners in the town and adjoining territory. Some knew the makes and models of the cars as well as the names of prospective car owners. A number of them also had a list of the tractor owners and prospective tractor users.

To these people they regularly sent folders, circulars and other advertising matter that the manufacturer supplied. This advertising literature bore their own names and addresses, so that the people would connect their store with the manufacturer's advertising. Their windows, their counters, walls and store fronts, all bore evidence that they were carrying these well-known lines.

9. They knew the goods they sold.

They studied the advertising, and they studied the articles that they handled, so that they had every selling point at their fingers' ends, and knew every detail of construction and operation.

10. They pushed the high-priced articles.

They put great effort behind the articles that brought a big price. For these articles earned larger profits and the sale of one of them equaled many sales of smaller articles. They did not wait for the customer to ask for the article, but wherever

they knew of a customer who could use the article to advantage, they would talk the merits of the device to him.

What Is Service?

The president of the Automotive Service Association of New York recently wrote to "K. C. B.," who writes one-line verses for the Hearst papers and asked him to give his ideas on "What Is Service." "K. C. B." set forth his ideas in his own peculiarly effective style, as follows:

| | |
|----------------------------------|-----------------------------------|
| MY DEAR Mr. President: | WITH CLERKS behind it. |
| JUST SUPPOSING. | AND THEY'RE all very busy. |
| THAT YOU'VE bought a car. | AND THAT'S all right. |
| AND YOU'VE spent a lot of money. | AND YOU pick out one. |
| FOR EXTRA equipment. | WHO SEEMS about through. |
| AND YOU'VE paid for everything. | WITH THE customer he has. |
| AND YOU begin to feel. | AND YOU lean against the counter. |
| IF YOU met the president. | AND LOOK around. |
| OF THE automobile company. | AND JUST about the time. |
| THAT IN all probability. | THE CLERK you've chosen. |
| HE'D RUSH right up to you. | IS READY for you. |
| AND SHAKE your hand. | A TELEPHONE rings. |
| AND WANT to know. | AND THEY call him to it. |
| HOW YOU like your car. | AND FOR five or ten minutes. |
| AND ALONG about then. | YOU LISTEN to him. |
| SOME LITTLE thing happens. | TRYING TO tell some one. |
| AND YOU have to get something. | WHATEVER IT is |
| FROM THE service station. | THAT HE'S trying to tell him. |
| AND YOU drive down there. | AND THEN he's through. |
| AND GO in with a smile. | AND COMES back again. |
| AND NOBODY meets you. | AND AFTER awhile. |
| AND YOU find somebody. | HE WAITS on you. |
| AND ASK politely. | AND SO far as I know. |
| WHERE THE dingbats are. | THAT'S THE only trouble. |
| OR THE guphus feathers. | I EVER have had. |
| OR WHATEVER it is. | AT A service station. |
| THAT YOU'VE come to get. | WHICH IN my opinion. |
| AND THE gentleman tells you. | SHOULD BE a place. |
| AND YOU go to the place. | WHERE YOU get good service. |
| AND YOU find a counter. | IN A pleasant way. |
| | I THANK you. |

8. Used the manufacturers' advertising helps.

I found that nearly every one had a mailing list. This list comprised

Realizing that it takes longer to sell such articles, they started the customer thinking about them long before they were actually ready to make the purchase. After that they regularly mailed literature which gave more details of the advantages of the article. In this manner they sold a good deal of high-priced merchandise and their sales ledgers showed rapidly-growing and larger figures.

11. They received excellent cooperation from their employees.

They established a system that made it worth while for the employees to do their best in the execution of their duties. They made the workers feel that every man in working for the good of the organization was also working for his own good. And they rewarded effort.

12. They sold service.

They knew the value of service. They rendered it. They sold it.

13. They read.

They were on the lookout for new ideas, and they made it a practice to regularly read one or more good trade publications. Through reading, they could also keep posted on the conditions of the market, and the news of the trade.

14. They were ambitious to do more business.

Despite the fact that among these men were some of the most successful men in the business, none of them had reached the state where they were in the rut of self-satisfaction. To a man, they were looking forward to even bigger things, striving harder every day, constantly improving and constantly broadening.

These are the things that my investigation brought to light. Since they have proved so helpful to all these men, I have no doubt but that they will prove helpful to you. Check them up with your own methods, and you may find an idea that is worth real money.

First Annual Exhibit of the Automotive Equipment Association.

Everyone voices opinions of praise for the automobile shows and thinks they are wonderful exhibits, and so they usually are. However, an exhibit, the first of its kind and one which in time will rival the automobile shows, was held at Medinah Temple, Chicago, during the week of November 3.

It was the fourth annual convention and first exhibit of the Automotive

Equipment Association, and to say the least, it was very successful. All of the accessories with which the motorist is acquainted and many other appliances and equipment for the automobile, the truck, and the tractor were shown. In addition, garage equipment was also on exhibit.

The main hall was filled to overflowing with booths, artistically and conveniently arranged for the instruction and information of the garageman, dealer, and automotive owners. The main auditorium parlors were also filled with booths. In all there were 136 exhibitors.

The automotive accessories of today are becoming so efficient and economical and at the same time so convenient when used in connection with the regular equipment of the car, that this particular branch of the automotive industry is becoming too large to be exhibited in connection with the automobile shows where of circumstances the accessory exhibits are usually only of second consideration.

This movement is in the right direction as it concentrates the attention of the dealer, garageman, automobile owner, and the public in general on this one phase of the automotive industry and, consequently, will be of mutual benefit to the dealers and the public.

National Motor Vehicle Theft Bill Now Effective Law.

On October 24, the Dyer bill, technically known as the National Motor Vehicle Theft bill, passed by the Senate and the House of Representatives, became operative, although not signed by the President. With this bill, interstate transportation of stolen cars and trucks becomes a federal offense, punishable by a fine of \$5,000 or a prison term up to five years.

That this law is recognized as a necessary measure is seen by the fact that it was passed by Congress during a special session convened to discuss the peace treaty, the strike situation, and other national problems.

Statistics from the chiefs of police of 21 cities show that 29,000 automobiles valued at more than \$27,000,000 were stolen in 1918. Of that number about 5,000 never were recovered. Protective associations were formed all over the country in an effort to wipe out this lawless industry, but very little headway was made.

Under the guidance of the National Automobile Dealers' Association,

work was begun on a program that would pass the scrutiny of Congress, and at the same time be a remedy as well as a law. The measure, which follows, promises to be an effective, as well as a practicable remedy:

"To punish the transportation of stolen motor vehicles in interstate or foreign commerce.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this act may be cited as the National Motor Vehicle Theft Act.

Sec. 2. That when used in this act:

(a) The term 'motor vehicle' shall include an automobile, automobile truck, automobile wagon, motorcycle, or any other self-propelled vehicle not designed for running on rails;

(b) The term 'interstate or foreign commerce, as used in this act shall include transportation from one state, territory, or the District of Columbia, to another state, territory, or the District of Columbia, or to a foreign country, or from a foreign country to any state, territory, or the District of Columbia.

Sec. 3. That whoever shall transport or cause to be transported in interstate or foreign commerce, a motor vehicle, shall be punished by a fine of not more than \$5,000, or by imprisonment of not more than five years, or both.

Sec. 4. That whoever shall, with the intent to deprive the owner of the possession thereof, receive, conceal, store, barter, sell, or dispose of any motor vehicle, moving as, or which is a part of, or which constitutes interstate or foreign commerce, knowing the same to have been stolen, shall be punished by a fine of not more than \$5,000, or by imprisonment of not more than five years, or both.

Sec. 5. That any person violating this act may be punished in any district in or through which such motor vehicle has been transported or removed by such offender."

Automobile Manufacturers of U. S. and Europe Form Alliance.

Trade groups of the automobile manufacturers of the United States, Belgium, France, Great Britain, and Italy have formed the bureau of permanent Alliance of the Constructors of Automobiles. The headquarters of this organization will be in Paris.

The National Automobile Chamber of Commerce is the American affiliate. The bureau will study questions concerning the development and prospects of the automobile industry and plan for the U. S. trade groups.

Taking an Inventory of Your Stock

Have You Been Stocking Materials Without Keeping a Record?—Is Your Supply Room a Collection of Iron or Does It Mean Something?—Why Not Arrange Your Material Systematically and Start the New Year Right?

By J. Newton Boddy

Manager, System Department, Tanner, Gilman & Ellis, Chicago

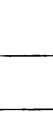
The taking of an inventory is one of the big problems of the average garageman or auto dealer. I believe I am conservative in stating that not one in five of those who actually take an annual inventory get it accurate. The value of a financial statement depends largely on the accuracy of the inventory.

Inventories may be divided into several kinds—physical, estimated, perpetual by quantity, perpetual by dollars and cents, and perpetual by quantity and amount. Perpetual inventories may be carried by items or by departments.

Where a perpetual inventory is kept, the business escapes the confusion, loss of time and service, and usual additional expense. Where a perpetual inventory is kept, the book records should be constantly checked against actual stock and corrections and adjustments made to keep them in agreement. Checking by items or departments involves but a few minutes' time each day.

Where a perpetual inventory is carried, the taking of an inventory is a very simple matter and can be done to suit the owner's convenience. It consists of taking the stock ledger and checking it, item by item, with stock on hand. However, as few concerns carry a perpetual inventory, or carry it in dollars and cents only, we are called upon to suggest an accurate and speedy method of taking inventory.

The taking of an inventory applies especially to the first two kinds mentioned — physical and estimated. The estimated inventory is a book inventory, and is set up by figuring a certain percentage of sales as cost of sales. As



Date _____ **No.** _____

Item _____

Size _____

Location _____

Date _____ **No.** _____

Item _____

Size _____

Location _____

| Quantity | Price | Amount |
|-----------------|--------------|---------------|
| _____ | _____ | _____ |

The Inventory Tag.

the item of freight, express, parcel post and other carriage charges on purchases is variable, the estimated inventory is seldom accurate and so cannot be relied on without verification by a physical inventory. And the speed and accuracy of taking inventory depends to a large extent on the preliminary preparations.

To start with, stock checks, as shown in the illustration, with stubs, should be purchased. These should show date, item, size, location, quantity, price and extension, and should have eyelets so that they could be either tacked or tied to bins or parts. Next, all stock should be properly assembled so that the same items will be as nearly as possible in one place. Now you are ready to take inventory.

Number and date sufficient tags, top and stub, to tag all your stock. Start in on a well-defined route and tag all your stock, in the salesroom, office, stockroom, shop and yard. Tag everything belonging to you and not actually a part of the building. Very many garagemen have open shop space or parking space which is often overlooked in taking inventory. When tags are all distributed, go back over your ground and fill in spaces on tags showing item, size, and quantity on both top and stub. When this is done you are in a position to pick out a few important items and verify the count on the tags.

Now collect your stubs, making sure that you have collected all issued. Arrange them numerically and see that there are no breaks in the numbers. When proper preparations have been followed your stock can be counted and posted on the tags after business.

(Concluded on page 46.)

[illegible]

Reduced Size Inventory Sheet—Used for Recording Quantity, Prices and Extensions.

The Layout of a Modern Garage

What Attention Are You Paying to Building Layout in Order to Secure the Largest Amount of Success in the Automobile Business?—Dealer's Idea of Proper Arrangement of a Garage to Give It an Air of Efficiency and Service

By Howard L. Manning

Probably no other conditions contribute more toward securing the largest amount of success in the automobile sales agency business than a properly arranged building, good order of stock and equipment, and all around cleanliness. The need of these is apparent to everyone and is admitted by all. They should, therefore, receive the most careful consideration from automotive dealers. They furnish real problems in the business and ought to be properly solved.

A properly arranged building will contribute a great deal towards handling the business in an economical, efficient and satisfactory manner.

A building should be composed of these five divisions: Salesroom; office, general office and accessory store; supply room; shop; and storage.

The accompanying sketch shows a floor plan of a one-story building, size 50 ft. by 100 ft., and located on a corner.

The salesroom, office and supply room are located in such a way that the person in charge of the office can readily control or wait on persons in all three. This arrangement is desirable so that one person can take care of the office, supply room and salesroom.

The salesroom is large enough to display an automobile and to hold in addition several chairs and a small table for literature, and there should be sufficient room to prevent a crowded appearance. A room, as shown on the sketch (about 18 ft. by 20 ft.) is usually suitable. This room should, of course, face the street, on a corner if possible and be visible through good-sized plate-glass windows. A car cannot possibly be shown to better advantage than when it is in a perfectly clean condition in a neat and clean salesroom well arranged and not crowded.

The salesroom should be entirely enclosed and separated from the rest of the departments. The partitions between the salesroom and the office may be made of wood to a height of about three feet and glass panels from there to the ceiling, so as to place the room under easy control of the office. Separating the salesroom has many advantages. The chief ones are these: It excludes dust, noises and other

annoyances, and enables one to obtain the whole attention of a prospective purchaser.

A rest room in the salesroom for use of women patrons is very desirable.

The general office should be located beside the storeroom, facing the street if

built that it can be kept under lock and under control at all times. It should be partitioned off completely from the shop. The door to shop should be provided with a window at which repairmen can call for supplies. The partition between the office and supply room should be solid to ceiling.

The supply room should have ample space. Plenty of space will more than pay for itself by the facilities offered for putting supplies in such order as will enable one to easily locate different items and to readily keep stock up to the proper amount. A supply room, 16 ft. by 22 ft., is none too large for even a small dealer.

The repair shop should be placed just back of the supply room for convenience in communicating with the office and securing repair parts from the supply room. Its size depends, of course, on the volume of work done. If possible it should be closed to the public and no one but employes allowed in it. Outsiders in a repair shop usually delay workmen and are also apt to cause accidents which often result in injuries to themselves.

The storage space and wash rack should be placed back of the repair shop.

The automobile entrance should be in the center of the front of the building and there should be an exit on the side. To facilitate driving in and out, store the cars at an angle as outlined in the sketch.

The arrangements, as here suggested may be made at a small cost in practically all buildings now used in the automobile sales business. No expensive material need be used and no fancy or expensive ornaments are required. Good material and paint will work wonders.

A building such as the one outlined makes it possible to handle the work in a manner that calls for a minimum amount of supervision and at the same time facilitates the service for customers.

Good order of stock and equipment is an important matter. All supplies should be kept in the supply room. No supplies of any kind should be displayed in the salesroom to detract from the appearance of the car. The car shown should be "king of its domain"—the salesroom.

Build Strong!

In every enterprise of a business or manufacturing nature, a profession or a trade, it is of paramount importance that the foundation—the groundwork—for that enterprise, whether it be tangible or intangible, be built strong.

Much of the success or failure is the result of this fundamental building. And yet, how soon would that undertaking collapse—prove a failure—if the work that follows it is indifferently carried on—that of maintaining the groundwork at a maximum of efficiency through modern methods, progressive ideas, changes and alterations of that which yesterday was sufficient to that which the advancement of today demands.

In the train of unprogressive thought which is speeding on to mediocre success and even failure, are many garagemen and dealers who have mistaken notions—especially those in smaller towns and agricultural sections—concerning the advantages of a salesroom, displays of accessories, advertising, proper arrangement of the building as a whole to make it more attractive, efficient and serviceable.

They think that a salesroom is not necessary because a comparatively small part of the population passes the place of business. Experience has proved that this is an absolute fallacy; nothing gives a place of business a better standing than a neat, clean, orderly salesroom containing a well kept car. It gives out an air of dignity and respectability that brings results no matter how small the town or how scattered the buying public.

This applies equally to the other departments of the garage—the store—the office—the supply room—the repair shop—the storage space. It is not necessary to rebuild—build up what you have started. A few dollars' worth of lumber and good paint will do wonders!

possible. Both rooms should be large enough to accommodate desks, chairs, office equipment, showcases, shelves and tire rack without crowding. The office proper can be separated from the store by a lattice fence or rail. The entire length of the window should have a platform for displaying accessories.

The supply room placed directly back of the office and storeroom, should be so

Provision can be made for showing supplies and accessories in the window in front of the office. The amount shown should be small, clean, well-arranged and changed frequently to secure the best results.

The stock in the supply room should be kept in a neat and clean manner. Every item should have a definite place and every item should be in its place. Supplies should not be thrown in bins or on shelves in any old manner, but should be piled in a good uniform way.

Emphasis should be placed on the fact that *all stock* should be kept in the supply room under control; not allowed to lie around where unauthorized persons might deliver it without proper charge being made. A great amount of profit is lost each year because of loose stockkeeping methods.

Shop equipment should be placed so as to be readily accessible and so that one item does not interfere with any other. Proper space should be provided for small tools so they can be readily located when needed. They should not be permitted to lie in piles on benches.

"Cleanliness is next to godliness." These words certainly are applicable to the automobile business. Nothing will so hamper the success of an agency as dirt and junk. They must not be permitted to accumulate in the salesroom, the office, the supply room, the shop, under benches, on benches, on window sills, or on walls.

Buyers of automobiles, automobile supplies and service, especially women buyers, certainly dislike going into a place where it is necessary for them to step over a

lump or puddle of grease, or oil, and where they cannot occupy a seat or touch anything because of grease and dirt. They will transfer their patronage as soon as possible to an up-to-date, clean, business place.

The building should always be perfectly clean. In fact, it should be cleaned daily without fail. This should be made the particular duty of one employee. There isn't the slightest excuse for any dirt anywhere. Window sills, ledges and walls are prone to be catch-alls for many articles, worthless and otherwise. Not a thing should be placed on them at any time.

Miscellaneous junk scattered over walls, sills and ledges certainly presents a bad appearance. A special place should be provided for junk. Under no circumstances should it be permitted to accumulate on or under work benches. It should be removed at least once daily to its special place and disposed of frequently to a junk dealer.

No old, used repair parts should be kept on hand in a junk pile with the idea of possibly using them at some later time. A repair part is either new, or as good as new, and should, therefore, be in the supply room; or else it is junk and should be in the junk box.

Enough paint should be used to keep the building looking neat inside and outside. A little paint will go a long way.

Cleanliness in a place of business pays big dividends. It impresses the public. It brings about a better spirit among employees. It makes them feel more interested in their work. It makes them take a pride in their employers. A clean work-

shop facilitates work there to a wonderful degree. It's a positive joy to work in a clean, light place!

A large amount of miscellaneous signs should not be shown about an agency at one time. One or two neat signs showing the name of the agent and the car he represents ought to be displayed. Advertising signs for accessories certainly should be shown, but not more than two or three signs should be displayed at one time.

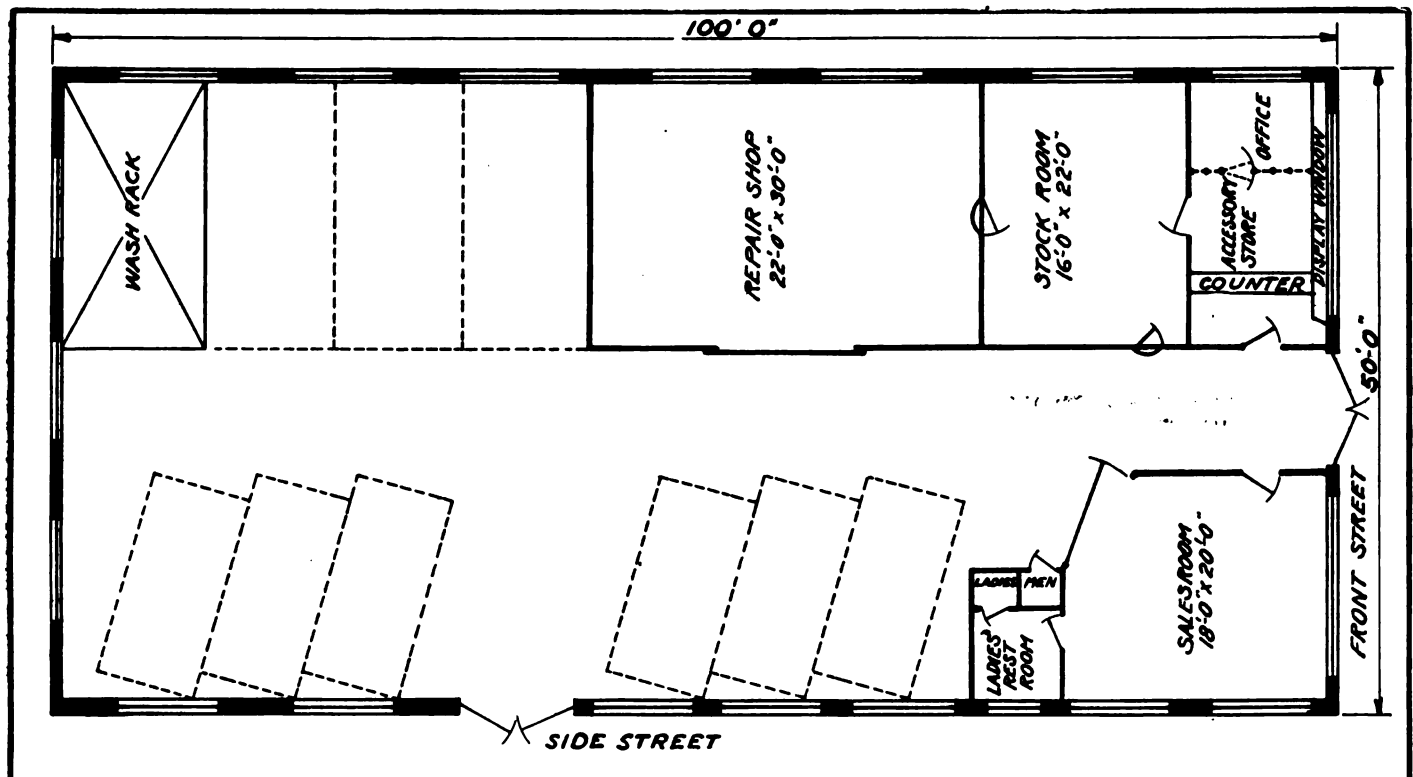
These signs should be so placed that they can be changed frequently, thereby keeping a fresh appearance. Avoid a "hodge podge" of signs all over the windows and walls. Above a reasonable number, the more signs there are displayed, the less chance there is that people will be able to read and remember any of them.

Take an inventory of the arrangement and appearance of your place of business and if any of the suggestions given would make an improvement, have the change made *now*. Such action will mean progress for the automobile business in general and for *your* business in particular.

Automobile Show in Paris, France, Is Well Attended.

Many prominent Americans were in attendance at the recent automobile show held in Paris, France.

Space rentals for this show exceeded all records. More than 7½ acres of exhibition stands were assigned to manufacturers for this event. Fifteen American manufacturers were represented together with every Continental car builder, as well as a great number of English makers.



The Layout of a Modern Garage Showing the Arrangement of Departments to Secure Greatest Amount of Simplicity and Efficiency.

Truck Routes and Garage Owners

Nebraska Garagemen in Motor Truck Delivery Business—Their Advantages Over Regular Truck Lines—Regular Lines Under State Supervision—Costs of Operation on a Ton-mile Basis—Records Which Should Be Kept.

By H. T. Dobbins

Garagemen in the smaller towns will find in the testimony brought out at a recent hearing before the Nebraska State Railway Commission, where trucking rates and rules were under discussion, an idea that might be worth cultivating.

The commission had put into effect a tentative set of rates and regulations, and after these had been in use for a time, called representatives of the trucking companies before it for the purpose of ironing out objections that had been made.

Most of the truckers operate regular lines between interior county-seat towns and the market cities of Omaha and Lincoln. They said that the business had been made unremunerative by the fact that a number of garage owners had purchased trucks and were using them to take away large chunks of their business. They called them scalpers and a few pet names like that.

But this is what the garagemen were doing: They employed a man with a wide acquaintance in their neighborhood, whose business was not only to solicit for the home truck line which makes regular or irregular trips to the market center, the shipments of hogs, cattle and grain the farmers had for sale, but to also take their orders for merchandise. Thus, Farmer Hamilton was asked to list whatever goods he would like to have—salt, dry goods, groceries, sugar, and other merchandise. When the truckman took his hogs to market, he would have this order filled and bring the goods back with him. In a number of instances this plan worked very successfully, in that it insured the home trucker a load both ways, whereas the line trucker had to depend largely upon the one-way load to market.

The disadvantage under which the line-man labored was this: That the only time his representative was in the territory was on the regular day he was advertised to be there, and at which time those who had shipments market-bound were to have them ready for him; whereas the local man timed his trips entirely by the necessities and demands of his patrons.

The line man, because he held himself out as carrier for hire, came strictly under the jurisdiction of the commission and could not cut his rates below those fixed by the commission, whereas the local man, while under a strict interpretation also

under state control, did not so regard himself, and not only was occasionally hauling stock to market below rates, but had all the best of it in a financial way, because, with a load each way, he was getting a bigger return on his investment than the line man, whose rates were based on an assumed cost of operation. In addition, this sort of competition was cutting into their trade, because the local man was performing a community service the other was not in a position to do.

Not all of this business was being done by local garage owners. A portion of it was taken care of by the local express and delivery companies that have been hard hit by the substitution of the trucker, which

adapted, the commission report says, to truck transportation under common rates and practices.

In this territory considerable trucking is being done, as many as 150 truckloads of live stock going therefrom to the South Omaha stock yards, while merchandise has begun to move from jobbing centers by means of trucks.

So far the jobbers have been the principal patrons of the trucking companies and their shipments have been largely those that ordinarily go by local freight in less than carload shipments. This has not been sufficiently developed to make certain that the truck that brings in livestock or other farm products will carry a return load. This is due to the fact that the jobber is always in a hurry to get his goods to the local merchant and will patronize the local railroad freight train unless he can get the trucker to move them at once, and this time of shipment does not, in many cases, coincide with that which the farmer has fixed for sending his stock to market.

The truckers are now considering the feasibility, in order to meet the home town trucker competition, of employing local men to solicit orders for goods in the

big market towns, in order to assure them of a fairly constant supply of loads when they go out after farm produce shipments.

The finding of the commission on the matter of costs of operation and what constitutes a proper rate may be of interest in this connection:

"We believe that the evidence is sufficient to form a fairly reliable estimate as to the cost of the service under consideration. There is nothing very definite as to the cost of overhead expenses, nor as to the return upon the investment necessary to attract capital into the industry, but we may safely draw upon common knowledge for these items.

"As to overhead expenses, we have assumed that the average carrier engaging in the business exclusively will aim at operating not less than five two-ton trucks, or the equivalent. Such a business will require a manager to develop the business to carrying capacity both ways over the routes selected and to look after the business generally.

"This service would be worth at least \$150 per month. The business will also require a bookkeeper, for which \$100 per

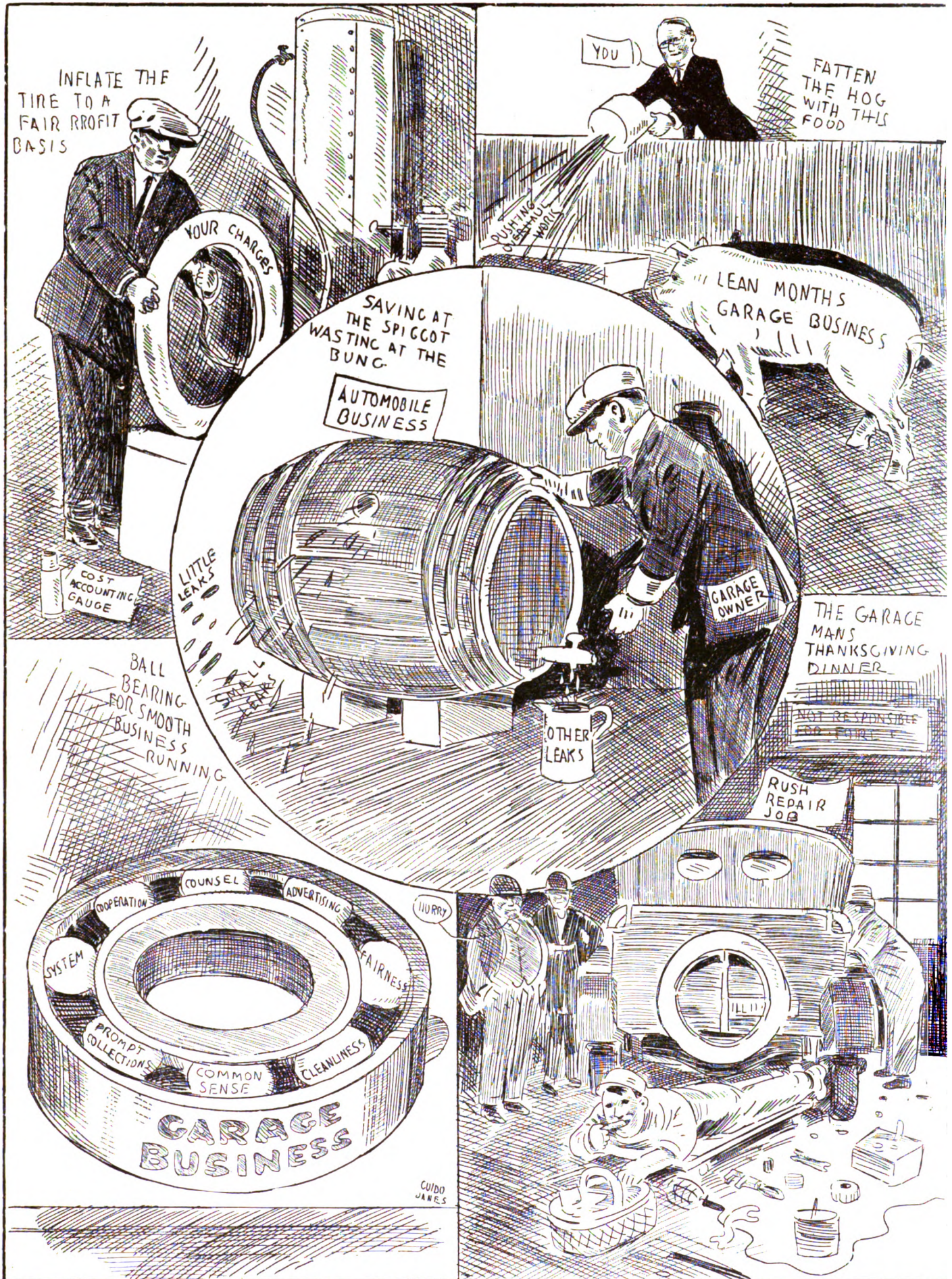
KNOWING WHAT IS WANTED.

A literary friend of mine said that he used to believe in the maxim that "everything comes to the man who waits," but he discovered after awhile, by practical experience, that it needed an additional clause, "provided he knows what he is waiting for." Unless you know what you are looking for and have trained eyes to see it when it comes your way, it may pass you unnoticed.—Woodrow Wilson.

drives up to a man's door with the shipment of goods intact for railway transportation, where he had a useful niche to fill.

Only the eastern third of Nebraska, the well settled and richest agricultural section of the state, has been set apart for regulation by the commission. The intention was to include only such territory wherein the circumstances and conditions surrounding the movement of freight over the public highways are substantially similar. Condition of highways, distances between towns, and density of traffic and population were taken as the controlling factors. This resulted in a district composed of all that part of the state running north and south along the western boundaries of Webster, Adams, Hall, Howard, Nance, Boone, Antelope and Knox counties.

The roads in this section are of clay and graded for the most part. The distances between towns are quite uniform. Population per square mile outside of the chief cities does not vary greatly, and the traffic comprises practically the same commodities. In fact, it would be difficult to find a territory with so large an area that is better



month is allowed. It will also require maintenance of a central office, books, records, and stationery, for which \$50 per month is allowed, making a total of \$3,600 per annum for overhead expenses. The return on the investment deemed necessary at this stage of the industry is 20 per cent per annum.

"The following table of costs depends for its accuracy, of course, upon the facts shown of record; and because many of these facts are not based upon a long experience, and because a number of them are estimates, the table is advisory only. The estimate of costs per ton-mile of transporting freight by motor truck over dirt roads in Eastern Nebraska on the basis of the movement of 4,000 pounds, 50 miles per day is as follows:

| Operating Expenses: | Cents per ton-mile. |
|--|---------------------|
| Gasolene and oil, gasolene at 25c per gallon; oil at 75c per gallon | 2.5 |
| Chauffeur's wages, \$24 per week for 52 weeks, plus traveling expenses at \$2 per day for 240 days per annum | 7.2 |
| Maintenance expenses: | |
| Running repairs 20 per cent of cost of truck per annum (cost \$1500 per ton) | 2.5 |
| Depreciation on truck on basis of 3 years of service, or 36,000 miles. | 4.16 |
| Repairs and renewals of tires on basis of 7,500 miles use | 1.87 |
| General Expenses: | |
| For salaries, rent, stationery, and incidentals of a company operating trucks of 10 tons' capacity \$3,600 per annum at | 3.00 |
| Insurance | 0.50 |
| Loss and damage | 0.80 |
| Taxes on basis of actual values of \$1,200 per ton first year, \$800 second year, and \$400 third year, and rate of 2 per cent on assessed value | 0.027 |
| Return, 20 per cent per annum on investment of \$1,500 per ton capacity | 2.50 |
| Total, cents per ton-mile | 25.057 |

A cost of 25.057 cent per ton mile amounts to 1¼ cent per hundred, per mile, approximately, and rates established upon present information will have to correspond with this cost.

"It will be recognized that a reasonable rate cannot be the same on all commodities. Feathers and flour do not bulk the same, and soap and silk are not worth the same per pound. Relatively reasonable rates are based upon weight per cubic foot, damage risk, empty haul requirements, value of service, volume of traffic, special equipment and other minor considerations.

In the early history of railroading, a separate rate was made for every commodity, but as commodities increased in number, the easier method of dividing the commodities into classes and giving the commodities in each class the same rate, was evolved, with a fixed relation between the rates. For example, the first-class rate was the highest and the other rates were stated in terms of percentage of the first-

class rate. It was found, however, that this method was too rigid for the development of maximum traffic and exceptions to the class rates and special commodity rates were adopted from time to time. But these are comparatively few in number.

"One of the essential requirements of every successful business is a record of the business. This is especially true of new enterprises, and the more complete the record is within reason, the greater the success. It makes possible the elimination of wasteful and unproductive features, and the promotion of productive ones; and the satisfaction in the owner knowing 'where he is at' all the while is not without substantial compensation.

"The previous discussion as to costs and ratemaking shows the necessity of keeping considerable records in the trucking field. The business cannot be permanently established without the information thus to be gained. For lack of sufficient data, the rates herein prescribed are not based primarily upon costs as in the railroad field, but upon what the traffic will bear. Manifestly, this is only temporary and until such time as the records will disclose that the rates are unreasonably high.

"In the first place, bills of lading, way bills and expense bills will have to be issued on the freight carried. We believe it advisable to prescribe the forms of these. The following records are necessary:

1. Dates of all truck movements.
2. Distances traversed by each truck daily, (a) under load, (b) empty.
3. Condition of roads traversed daily as to passability, whether good, medium or bad.
4. Miles of (a) paved roads, (b) unpaved roads, traversed by each truck daily.
5. Description, weight, length of haul, and charge of each shipment.
6. Names and addresses of consignor and consignee of each shipment.
7. Condition of each shipment on delivery.

"Account must be kept of all receipts and expenditures according to double-entry system, and in such manner as to show separately the following:

1. Cost of property:
 - (a) Trucks.
 - (b) Real estate and buildings.
 - (c) Shop equipment.
 - (d) Office furniture and fixtures.
 - (e) Stationery and supplies.
 - (f) All other property.
2. Cost of operation:
 - (a) Gasolene and oil.
 - (b) Drivers' wages.
 - (c) Drivers' traveling expenses.
 - (d) Freight house men's wages.
 - (e) Other operating expenses.
3. Cost of maintenance:
 - (a) Tire repairs and renewals.
 - (b) Repairs to trucks.
 - (1) Labor.
 - (2) Material.
 - (c) Truck renewals.

"(d) Repairs and renewals to buildings occupied by business.

"(e) Repairs and renewals to shop equipment.

"4. General costs:

"(a) Salaries of manager and office force.

"(b) Rent, heat, light, water, telephone and telegraph.

"(c) Replenishing stationery supplies.

"(d) Insurance.

"(e) Loss and damage to freight.

"(f) Taxes.

"(g) Incidentals.

"5. Cash on hand.

"6. Capital invested.

"7. Operating revenues.

"8. All other revenues.

"9. Revenues set aside to reserve for truck depreciation on basis of 4 cents per capacity ton mile.

"10. Dividends declared and paid.

"11. Surplus revenues.

"All accounts must be balanced monthly and a trial balance entered on record."

LEGAL NOTICE.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912.

of The American Garage & Auto Dealer, published monthly at Chicago, Ill., for October 1, 1919.

State of Illinois, County of Cook, ss.—Before me, a notary public in and for the state and county aforesaid, personally appeared R. B. Johnston, who, having been duly sworn according to law, deposes and says that he is the editor of The American Garage & Auto Dealer, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher—American Garage & Auto Dealer, Inc., 116 S. Michigan Ave., Chicago, Ill.

Editor—R. B. Johnston, 116 S. Michigan Ave., Chicago, Ill.

Managing Editor—R. B. Johnston, 116 S. Michigan Ave., Chicago, Ill.

Business Manager—J. R. Hastie, 116 S. Michigan Ave., Chicago, Ill.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock): H. D. Fargo, 116 S. Michigan Ave., Chicago; J. R. Hastie, 116 S. Michigan Ave., Chicago; J. C. Kelsey, 1131 Lunt Ave., Chicago; S. R. Edwards, 116 S. Michigan Ave., Chicago; I. B. Lipson, Fort Dearborn Bldg., Chicago; E. X. Mudd, Fisher Bldg., Chicago; E. C. Hole, 431 S. Dearborn St., Chicago; S. G. Levy, Fort Dearborn Bldg., Chicago; E. T. Clissold, 327 S. La Salle St., Chicago; R. S. Clissold, 327 S. La Salle St., Chicago.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.)—None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

R. B. JOHNSTON,

Editor.

Sworn to and subscribed before me this 30th day of September, 1919.

(Seal.)

E. V. CROSS.

(My commission expires Oct. 24, 1920.)

Practical Hints for Shop Mechanics

Conducted by E. C. Pohlmann

To Prevent Grease Leakage.

An easy method of stopping the leakage of grease from the differential to the brake bands is to wrap a piece of felt $\frac{1}{4}$ inch square and about 2 ft. long around the axle.

The wrapping should be done in an opposite direction to the rotation of the shaft when driving the car forward. Fasten the ends of the felt with cord, then shellac. The thread thus formed will act as a screw pump and will force the grease back into the differential.

* * *

Removing Tar.

While tar is still in a soft condition it can be removed without injury to the varnish of a machine by applying warm water and a good body soap. Vaseline and grease or lard can also be used.

* * *

Adjustable Boring Tool.

To do away with the possibility of the boring tool bending when working on short pieces, use an adjustable tool as shown in the illustration. The real cutting tool is made of a piece of round steel and is held in a bored-out, cut-off piece of cast-iron.

* * *

Lathe Chattering.

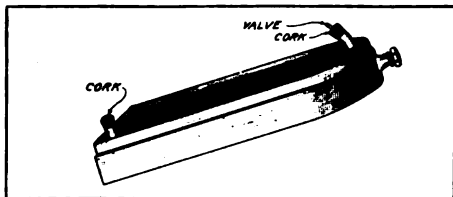
When chattering occurs in the course of turning on a lathe, the fault is usually blamed on the tool, or perhaps defective machine construction.

There are other causes, however, and the principal one is that due to the work-piece itself. So when chattering occurs, do not blame the tool or the machine, but see if the piece in question can be cut under the circumstances without chatter.

* * *

Testing Leaky Radiator.

Radiator leaks, especially if they are on the inside, are very hard to locate. Again, after repairing a radiator leak, it is hard to tell whether the opening has been closed



Method of Testing Leaky Radiator.

or not, and it does not pay to replace the radiator without being sure that it does not leak.

If the radiator has sprung a leak, it is best to remove it in order to make a good

job. To locate the leak, plug one end of the radiator very tight with a cork. Fill the radiator nearly full of water and plug the other end (see illustration) with a similar cork into which has been inserted an old inner tube valve.

Then with an ordinary hand or foot

ONE DOLLAR EACH!

Each shop hint and illustration printed in this department means one dollar or a renewal of subscription to the person sending it in. You have some time or labor saving ideas which you know are thoroughly practical. Tell us about them in your own language. Write out a brief description, with a sketch if necessary, that is all we require. We will fix up the sketch for reproduction, a finished drawing is not needed, simply a free-hand sketch. You get a dollar if the idea is worth publishing.

pump put the water under slight pressure. If the radiator leaks, a small stream of water will indicate the exact location.—V. C., Maine.

* * *

First-Aid Supplies.

In every garage there is need of first-aid supplies. Cuts, burns, bruises, or sickness of any nature should receive immediate attention. In all factories, the slightest abrasion or cut has to be reported and attended to, and it is well that that is so, for a cut, no matter how small, is liable to result in serious complications and—as it has happened—even death.

In the garage, while repairing, it is of usual occurrence to get cut, bruised, or burned, and for that reason, each garage



First-Aid Cabinet.

should have first-aid supplies. These should be: Burn dressing; gauze; bandages; Johnston's first-aid for wounds, No. 3; Johnston's adhesive plaster, one inch wide; four-ounce absorbent cotton, steril-

ized; first-aid book; pair of scissors; pair of tweezers; and three-ounce bottle of tincture of iodine, alcohol, green soap and aromatic spirits of ammonia.

These should be kept in a sanitary box, as shown in the illustration. This box, which should be painted white, can be placed in the repair shop, but it is less liable to become soiled or damaged if kept in the office.—C. A. P., Ill.

* * *

Turning Aluminum.

Aluminum, perhaps of all metals, is the hardest to work in a lathe; to overcome this to a certain extent use petroleum as a cutting lubricant. In stamping or drawing aluminum in a press, use a little vaseline.

* * *

Belt Trouble

Trouble is very often experienced with belts which do not track properly, and which are continually slipping from the pulley. When this occurs on the lathe, it is usually the fault of the position of the lathe, which is either not in line with the countershaft or not level.

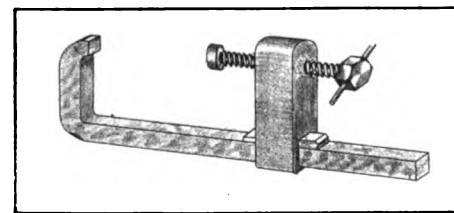
The accuracy of a lathe depends a great deal on the manner in which it is erected and leveled. Place level across the ways near the head stock, and repeat this operation at several points along the entire length of the bed, leveling carefully in every direction.

Shim underneath the legs with shingles until the lathe is perfectly level. When the countershaft and spindle cones are in their relative positions so that belts track properly, fasten the lathe firmly to the floor with lag bolts.—G. E., Pa.

* * *

Variable Length Clamp.

Very serviceable and inexpensive shop clamps, that are adjustable for various lengths, can be made from odds and ends of stock, as shown in the illustration. The



Adjustable Shop Clamp.

frame, A, of the clamp is made in one piece from $\frac{1}{2}$ -in. by $\frac{3}{8}$ -in. bar stock forged at the end, B, to make the jaw.

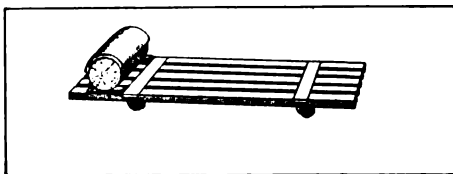
The moving jaw, C, is made from a short piece of $1\frac{1}{4}$ -inch square steel and can be

secured in any position desired by a taper wedge key, *D*. A machine bolt forms the jaw screw.—C. H. W., N. H.

* * *

An Adjustable Head Rest.

At times it is necessary to work almost directly over one's head—in that case, one



Adjustable Head Rest.

wants his head to lie on the dolly. At other times it is necessary to work so that the head should be raised quite a bit.

The adjustable head rest, shown in the illustration, consists of a short piece of round wood attached to the dolly with an ordinary shed hinge. The top side of the wood is padded to make a soft rest.

When it is desired to raise the head rest, a block of wood is slipped under it. The hinge makes it easy to raise or lower the rest and the block of wood holds it in the desired position.—S. O. F., Kas.

* * *

Pipe Threading in Lathe

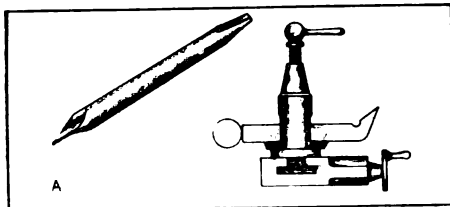
To thread pipe in an ordinary lathe, chuck the dies and insert in the dies the end of the pipe to be threaded, supporting the outer end in a steady-rest. To keep the pipe from turning, grip it with a pair of pipe tongs or a Stilson wrench.—E. B.,

* * *

Centering in the Lathe.

Centering can very readily be done in the lathe as well as in a special machine. To do this a boring tool is ground to the desired angle and the shaft or whatever it may be, after having been approximately centered, is held between the live center and the centering tool.

Then the butt of an ordinary lathe tool is presented, as shown, to the side of the piece, and the latter rotated slowly until the contact between it and the tool-butt



A.—Tools Used in Centering Work-piece.
B.—Oil Grooves in Lathe Center.

is the same all around the circumference and along the entire length of the piece. When this condition is obtained, the piece is truly centered and the centering tool can be driven in.

Oil Grooves in Lathe Centers.

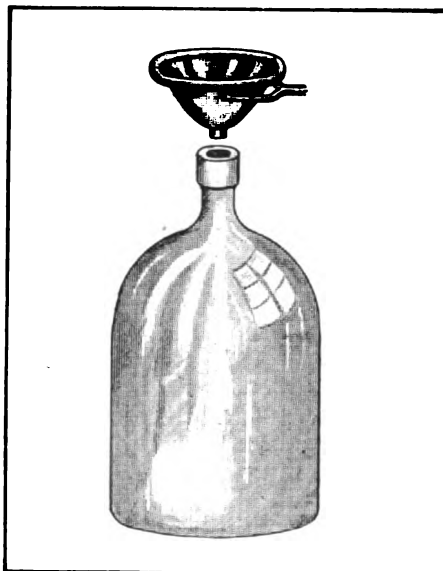
Due to insufficient lubrication, the lathe centers sometimes wear very rapidly. To prevent this and make the lathe-centers last much longer, punch three or five radial grooves which will serve as oil channels. Do not punch two or four. To do this, make a punch out of an old three-cornered file ground down to a triangular pyramid or "trocar" point.

* * *

Finding Shorts.

Short-circuits in electrical systems are sometimes hard to find unless a tester of some kind is used. An inexpensive yet accurate and efficient tester can be made in the following manner:

Nearly every shop has an old electric horn lying around which will answer the purpose. Connect four dry cells in series and attach one wire to one of the posts of the horn. Now take two pieces of wire and attach one to the remaining post on



A Handy Funnel from Headlight.

the horn and the other wire to the remaining terminal of the battery. These last two wires should be five feet long.

To test any circuit, place one of the long wires on the contacts of each end of the circuit and if the horn blows it indicates that the current is going through this circuit and, therefore, the short is not in that circuit. In this manner the entire system may be tested out very effectively.—J. E. L., Ill.

* * *

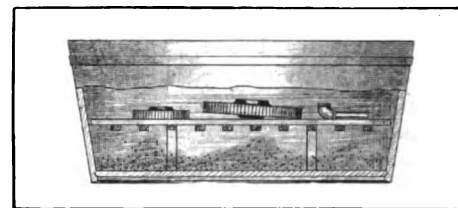
Clogged Gasolene Line.

When an engine fails to speed up, but runs smoothly at normal speed, the trouble is usually a partially clogged gasolene line.

Because the gasolene cannot flow through the pipe fast enough to satisfy the increased demand, the engine is sluggish. More dirt accumulates and the engine slows down, backfires at the carburetor and soon stops. The gasolene can get through, but not fast enough.

While searching for the trouble, the float chamber in the carburetor gradually fills. Then the engine can be started, but it will run only until the gas that has accumulated in the float chamber has been used; then the engine stops again.

This is the characteristic symptom of a



Using Tub for Cleaning Parts.

clogged gasolene line: the engine stops, but may be started after a time only to run a moment and then stop again.—R. H.,

* * *

Funnel From Headlight.

A headlight that has become useless owing to its old life can be converted into a handy funnel for filling containers, as shown in the accompanying sketch.

The glass and frame, together with hinges and lamp sockets, should be removed but the bracket should be left on to provide a handle.—C. H. W., N. H.

* * *

Removing Carbon

Repairmen should be cautious about removing carbon deposits with oxygen from engines equipped with aluminum pistons. For the extreme heat generated by this operation is more than likely to melt the aluminum of the piston.—M. P., Conn.

* * *

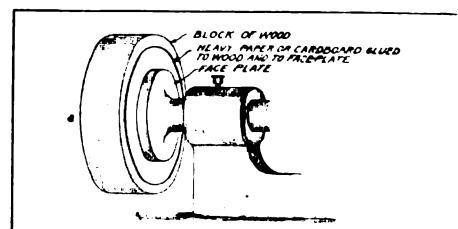
Kerosene Tub.

An ordinary tub is generally used by mechanics for the purpose of washing parts in kerosene. When used, however, it is well to place a grating about five inches from the bottom, through which the sediment can pass and rest in the bottom of the tub and not be stirred up each time a part is washed. This arrangement will enable the kerosene to remain clean for quite a time.—G. S., Ill.

* * *

Fastening Wood to Face-plate.

To turn wooden patterns do not screw the work to the face-plate. Glue the piece



Fastening Wood to Face-Plate.

to be turned to a strong piece of card-board and then glue to the face-plate.

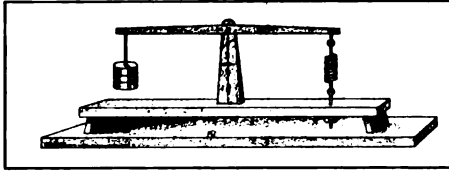
The heaviest pieces can thus be fastened; and all that is necessary to remove them from the face-plate is to insert a chisel

between it and the piece of wood and wedge them apart. A little water will separate the paper from the wood and the face-plate.

* * *

Spring Testing Device.

The tension of small springs, such as governor springs, can be correctly determined by a delicate balance, as shown in the accompanying drawing. It consists of



Device for Testing Springs.

a platform on which is mounted an upright, at the top of which is an arm.

At one end of this arm, the weight is suspended, while an adjustable fitting at the other end provides for different sizes of springs. The pointer at the center of this arm indicates the accuracy of the balance. It might be further suggested that with slight modifications the same device can be used successfully in testing valve springs.—G. S. L., Ill.

* * *

Cutting Threads.

In cutting screw threads on the lathe, the carriage is always driven by clamping the half nuts on the lead screw; the friction feed should never be used when cutting threads.

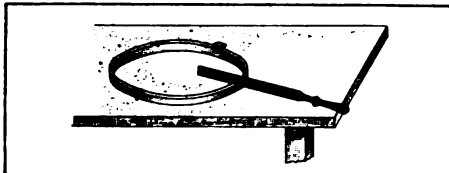
See that the feed knob is not tight, but loose or neutral, so that neither the power cross feed nor the longitudinal feed can possibly get into action while cutting threads.—J. K., Cal.

* * *

Fitting Step-Joint Piston Rings

When fitting step-joint piston rings, instead of placing them in a vise and filing one face at a time, file both adjoining faces at one time by the method illustrated. The necessary tools are: A flat file with the narrow edges filed off, and a table into which are driven two nails at a distance slightly less than the outside diameter of the ring which you intend to file.

Lay the ring flat on the table and force it between the two nails until the ends close lightly upon the cutting sides of the



Method of Fitting Piston Rings.

file. After filing off a little in this manner, turn the ring over and take an equal amount off of the other side of the joint. This method is especially valuable when a perfect fit is desired.—A. E. H., Mass.

Tire Gage Protection.

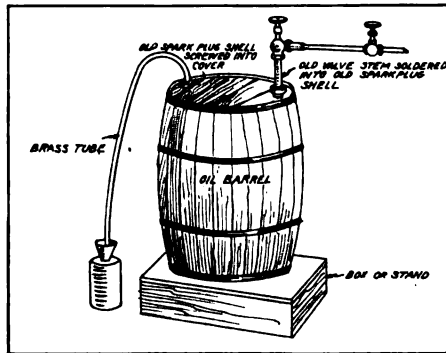
It is often experienced by garages furnishing free air service that the testing gage is easily mislaid or stolen. This inconvenience can be avoided by providing a small chain about 8 feet in length, to one end of which should be attached a leather ring, and the gage to the other end.

This can be hung on a hook close to the air nozzle so that it can be swung into using position, or can be removed from the hook to the tire to be tested.—G. S.

* * *

Transferring Oil.

An easy way to make an air-pressure oil-transferring device is to allow a brass tube to extend from very near the bottom of an oil barrel up through an old spark plug shell tightly secured in the barrel head a few inches from the edge. This tube should reach about six inches above the top of the barrel and bend over in a U shape, so that the oil can flow through it



Arrangement for Transferring Oil.

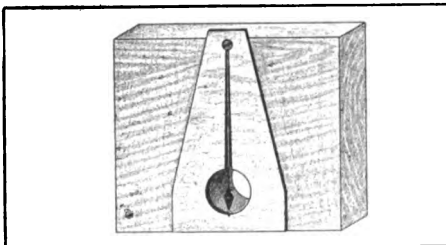
and into a smaller receptacle, the top of which should come below the bottom of the barrel.

Into a second old sparkplug shell, solder an ordinary tire valve, and screw this plug into a hole in the barrel head near the edge and diametrically opposite the plug containing the brass tube. The air pressure is applied through the valve stem as indicated in the illustration.—G. L. S.,

* * *

Nut and Bolt Case.

A great deal of time can be saved by constructing a holder, so arranged that

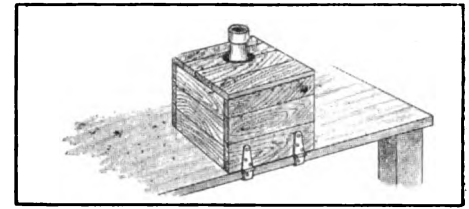


A Handy Leveling Tool.

nuts and bolts of given sizes and from the part of the car that is being worked on, can be kept together. Erect several pieces of stiff wire or wooden pegs on a board a foot square, over each one of

which nuts and washers of a given size can be dropped. For example, all the nuts and washers holding together the two halves of the crankcase should be carried on one of these wires or pegs.

This board should be inserted in a box about six inches in depth, allowance being made for slots around the side of the board. Each of these slots should be of



A Simple Carboy Tipper.

different width, so that bolts of different sizes may be stood vertically in the slots and supported by the heads which slightly overlap the edge of the square board on one side and the side of the box on the other. This arrangement is even better than a compartment box, for the reason that the nuts are always in view of the operator.—G. S., Ill.

* * *

Handy Carboy Tipper.

The simple ideas that prove their value at a glance are the ones that have always appealed to mechanics, and the carboy tipper, made by the use of two plain strap hinges secured to the edge of the bench and to the carboy case, as shown in the illustration, is of sufficient value to be passed along.

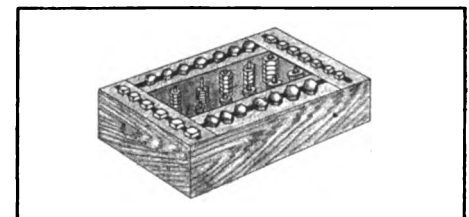
The hinges make it a simple task to pour battery acid into small containers from the large carboy.—C. H. W., N. H.

* * *

Leveling Tool.

In an emergency case when a level is required, and there happens to be none in the shop, it is a very easy matter to construct such a tool without the usual glass tube and liquid.

Cut out a piece of sheet metal in the shape indicated in the accompanying drawing. Make a round opening in which a small plumb-bob with a fine silk fishing line should be supported, fastened at the top



Convenient Nut and Bolt Case.

and in the center of the long opening. Cut a notch in the lower edge of the round opening so that when the tool rests on a surface which is perfectly level, the bob will hang in the center of the notch.

Centering and the Square Center

Location of Centers, Especially if Shaft Is Nearly the Exact Size, Is Very Important in Lathe Work—Method of Locating Centers by Using the Special Tools, Bell Center and Center-marking Square—Use of Square Centers

By J. N. Bagley

After placing a shaft between the centers of a lathe, it should run true, or where a fixed point is set to touch its perimeter, it should have an equal degree of contact all around the circumference and at any part of any length of the shaft from center to center as it is rotated on the centers. It is, therefore, necessary to have an exact center at each end of the shaft where it bears against the lathe centers. In case the center is bearing to one side and the shaft, when revolved, touches only on one side, it is said to run "out of true."

A shaft out of true will be cut from only one side until the high side is cut away and the tool cuts equally all the way around the shaft. In case there is plenty of stock, it does not matter so much, except that the cutting is a waste of time.

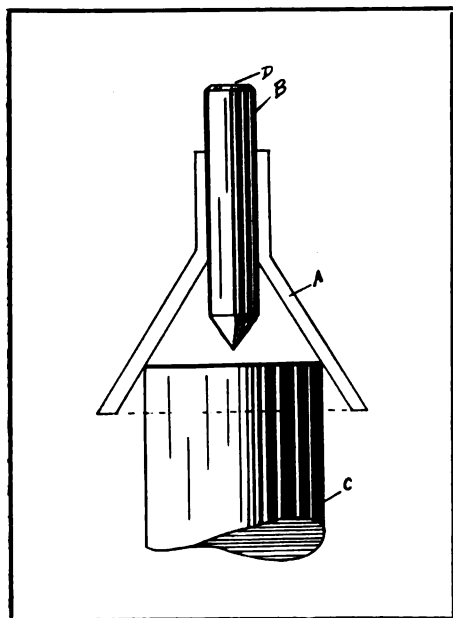


Fig. 1—The Bell Center Punch.

If the shaft is very nearly the exact size, it is necessary to have it centered very closely or the shaft will be found to be under size when the cut is made deep enough to true the shaft.

"To true up," so to speak, is to take off the shaft a cut of sufficient depth to cause a fixed point to touch the shaft surface equally and continuously at all points as the shaft is revolved.

"Roughing the work," as it is termed by the machinist, consists in taking off a cut, reducing the diameter of the shaft to nearly a finishing size, or until a couple of cuts will finish the job. Some machinists prefer to finish at a single cut, while others use two cuts to finish to the required dia-

meter. This is a matter of choice as either method, under ordinary conditions, is very satisfactory.

"Outside work" is referred to when all metal is removed from the outer surface of the work-piece. The work done inside holes or recesses is termed "inside work."

The very first thing to consider in getting a piece of work ready to be turned on the lathe is the finding of the center. There are a number of methods of doing this, but only two or three of those in common use will be discussed. If a tool known as a "bell-center punch" is at hand, the job of centering will be an easy one. The bell punch consists of a bell-shaped body, shown at A, Fig. 1, having a sliding punch, B.

To use the tool, place the bell over the

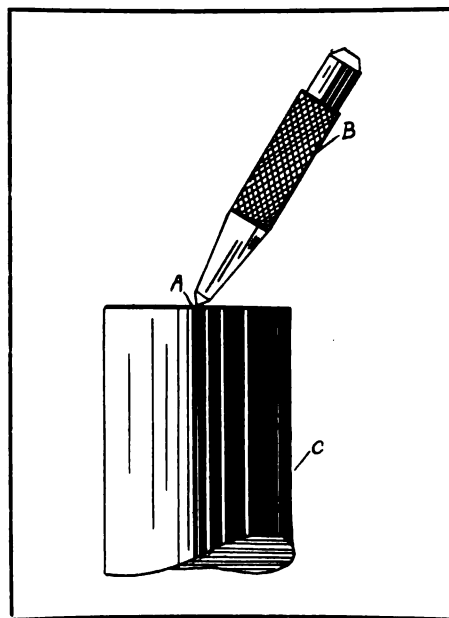


Fig. 2—Moving the Center.

shaft, C, and, holding it perfectly square over the shaft, strike it a sharp, light tap at D, with a light hammer. Upon removing the tool, a small punch mark will appear sufficiently close to the center of the shaft for ordinary work. This tool is very inexpensive and can be purchased from almost any tool or supply house.

After the center has been located, a caliper may be used to test the center. If it is found a little to one side, the center punch may be used to straighten the center up as shown in Fig. 2. Place the punch B, in position on the shaft, C, with the point in the direction the center is to be moved. Hold the punch firmly with one hand and strike punch B a light tap

with a hammer, moving the center, A, over. Now holding the punch in an upright position, strike it a second tap making the new center. Test again with the caliper and if it is not in the center of the shaft move it again in the same manner. Continue this process until the exact center of the shaft is obtained, after which the center hole can be drilled for the lathe as will be explained later.

A center-marking square, which is a very satisfactory device for locating centers of shafting of various diameters, is illustrated in Fig. 3. Place the square, A, against the shaft, B or C, as shown and with a sharp instrument make a line along the blade of the square. Turn the square one quarter of a circle and mark a second line as shown by dotted line D. The in-

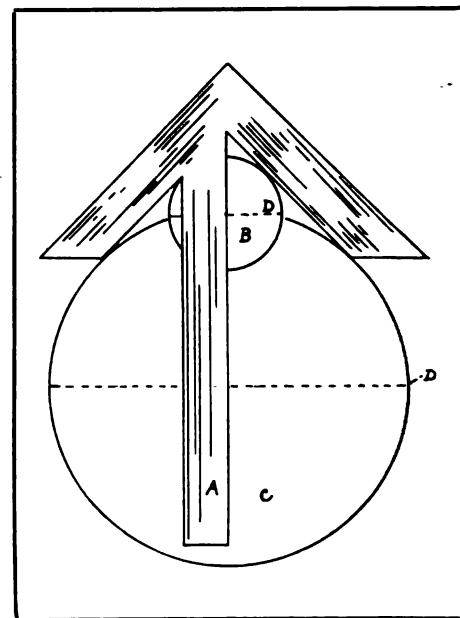


Fig. 3—The Center Marking Square.

tersection or crossing of the two lines gives the center of the shaft.

As will be seen from the size of shafts B and C in Fig. 3, this square will work well on shafts of various diameters. It works very well on large face plates or gear wheels. Of course, on large work it will be necessary to use a larger square. This tool can also be purchased at most any tool supply house, or a similar instrument can be made that will answer very well.

In Fig. 4 is shown a shaft, A, and a pair of hermaphrodite calipers, B. The calipers consist of two legs pivoted at one end allowing them to be opened and closed at will. The bent leg of the caliper is

placed against the perimeter of the shaft while the pointed leg remains in the mark made by the prick punch. By holding the caliper steady and revolving the bent leg, one can ascertain whether or not the

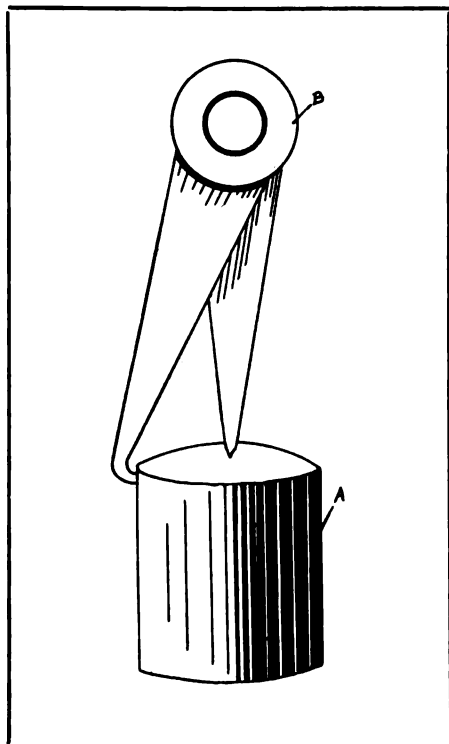


Fig. 4—Using the Hermaphrodite Calipers. center is properly placed. In case it is not, it can be moved to one side a trifle with the center punch and hammer as already explained.

The hermaphrodite caliper will be found valuable in testing centers even though the bell punch or the square is used. This caliper can also be purchased from tool supply houses and is inexpensive considering the many uses it can be put to.

After locating the center, the next step is to drill and countersink them to fit the lathe centers as shown at A, Fig. 5. Drill a small hole sufficiently deep so that the point of the latter center cannot reach bottom when it is properly seated. Then with the countersink ream the hole until a suitable bearing for the center will be obtained as shown at B. Before placing the work in the lathe, a drop of oil should be placed at A, in the "live" or tail-stock center. In case the work is heavy or running at a high speed, it will be necessary to stop occasionally and supply fresh oil.

If it is necessary to take up slack between the centers from time to time by moving in the live centers, the cut will not be true. There will also be danger of the cutting tool running under the work and breaking either the tool or springing the work, and many times springing the lathe live spindle so that it will not run true.

In Fig. 6 are shown two styles of square centers which many machinists prefer to use. Style A, the plain square-cornered center has flat sides which serve to keep

the center true with the drilled holes. This style of center is very good as it cuts slowly and "in true." It is a trifle difficult to sharpen.

At B, Fig. 6, is the same center fluted. This style of center cuts faster and is much easier to sharpen.

In using either of these, the center is fed by the tail-stock. In case the work is a little heavy, a very good plan to prevent the weight of the shaft cutting the center to one side, is to release the work at intervals allowing it to turn quarter way around thus making the square center cut the center in the shaft exactly. Should the center tear rather than cut, the chances are it is not ground true or the material is not good.

The shaft being centered in the lathe we are ready for cutting. The proper shaped tool for the cutting will depend entirely upon the kind of metal to be cut, the amount of metal to be cut off, and the purpose of the cut—whether roughing or finishing—the degree of hardness of the metal, and the speed at which the work is to run in the lathe.

The diamond point tool for ordinary straight turning will be found very satisfactory—some term this a front tool. The cutting action of the tool depends upon the angles of one to the other faces, and the position the face of the tool is presented to the work.

In case the tool is set below the central line of the revolving shaft and the cut is heavy, it will have a tendency to tear the metal rather than cut, and in case the cut is heavy, the shaft will spring and crawl over the tool, breaking either the tool or springing some part of the lathe. On the

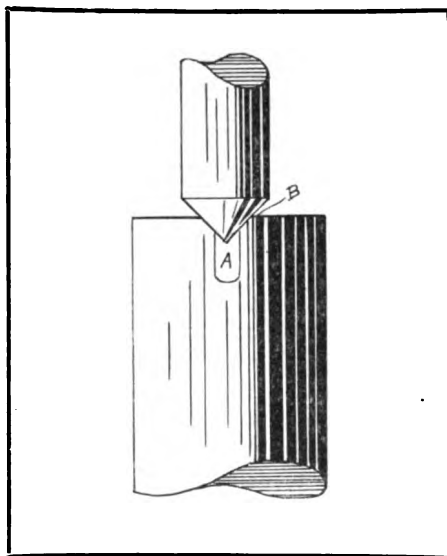


Fig. 5—Fitting the Lathe Center.

other hand, in case the tool is set too high, the cutting edge will be above the central line of the shaft and the rake of the tool will drag, springing the shaft back as the tool is fed to the work.

When the tool is properly set and the speed of the work is correct, the cutting

will curl from the tool in a small spiral shape from one to ten feet without a break. Care must be taken in setting the tool for brass turning, for that requires an entirely different setting from that for steel.

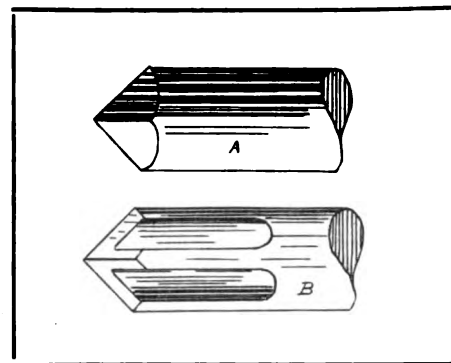


Fig. 6—A—The Plain, Square Cornered Center. B—The Square Center Fluted.

For instance, if the tool is set high or low, it will rip and tear the metal rather than cut, and the surface of the work will be a mass of small pits. For a very high finishing cut on steel, a sharp cutting edge, striking just above the center-true work, will give good results.

"Jarring or chattering" is the term applied to a condition in which the tool does not cut the work smooth but leaves a succession of small elevations and depressions on the surface. Jarring or chattering usually takes place when the work is long and running at a speed a trifle faster than it should be with a tool not having the proper setting. As a rule, brass is more likely to chatter than steel and it commonly occurs in boring holes. A cutting tool with a broad edge also causes chattering, especially on light, high-speed work.

A Combined Gasolene and Steam Engine Invented in England.

In the Journal of the Royal Society of Arts (London, June 6) is described a combined internal combustion engine and steam engine recently invented by W. J. Still. The engine is designed to combine the principles and advantages of both the steam engine and the ordinary gasolene engine.

The Still engine is so designed that the waste heat from the explosion is utilized to evaporate the steam, which is expanded in a combustion cylinder on the other side of the main piston. Its primary object is not to use the waste heat for raising steam, but first to use it in improving the thermo condition of the working cylinder, so as to insure the maximum efficiency from the fuel that is burned.

It is claimed that the combination of this principle gives an efficiency about 30 per cent. higher than the best gasolene engine. It is said that this engine surpasses the Diesel, which is the only internal combustion motor in which the stroke is not produced by an explosion.

Readers' Questions and Answers

Knock in Engine.

Recently I overhauled a 1917 Ford which had a loose main bearing. This I tightened and at the same time tightened the connecting-rod bearings after scraping them in to a nice fit. The party complained of a squeaking noise which I knew was the result of the piston rings being a little too tight and which I knew would stop as soon as the piston rings wore down. Is it good practice to let a squeaking new ring wear the squeak out?

Now the motor has developed a new sound, which upon starting the engine, with the car at a standstill, resembles the sound of an object striking the wooden ring of a snare drum. This knock is very regular

and is noticeable and distinct as motor picks up with car at a standstill.

The noise is not as noticeable when the motor is pulling hard. On a level roadway and at a speed of from 20 to 30 miles per hour, the noise assumes a rattle which is very severe. The motor has plenty of power and otherwise appears to be in good condition.

I went over the motor a second time to make sure that the connecting rods were tight, took out the third piston, and tightened the wrist-pin bushings. This did not help it any for the noise is still there. Some of the men think that it is a piston slap, but the pistons seem to fit reasonably tight. When the engine is running, and the car is at a standstill, the noise, when under the car, seems to be in or near the fourth cylinder, but when standing in front, it appears to be in No. 1 or No. 2 cylinders. Furthermore, the noise is much louder underneath the car than on top. Will you please advise us as to the possible cause of this knock?—W. C. S., Ark.

When replacing worn piston rings it is best to wear them in so that they fit perfectly and never let a squeaky ring wear the squeak out itself. All well-made piston rings will fit perfectly in the cylinders, but occasionally you will find that some will not. In that case it is best to lap them in to a perfect fit.

From the information which you have sent us, we judge that the noise is due either to a loose connecting-rod bearing or

Conducted by E. C. Pohlmann

Get into the habit of asking questions! The more you ask about your business the more you will know, and the more you know the more money you can make. Do not hesitate to send in your questions, whether you are a dealer, a salesman, a mechanic, a service man, or a stockkeeper, they will be gladly answered.

Perhaps there is something you want to know about a certain car or truck or the specifications of some particular tractor or how to store repair parts, or increase the efficiency of your repair shop. We welcome queries about anything and everything connected with the automotive industry. When a quick answer is desired we will send a reply by mail, otherwise the answer will be printed in this department.

else a worn piston. It may be due to a worn cylinder caused by a tight-fitting piston ring, resulting in considerable looseness between the cylinder wall and a piston, thereby causing a piston slap. A piston slap is possible even with tight-fitting rings. We would advise you to carefully examine the cylinder in which you think the knock is occurring.

In order to determine whether it is a

fled by the heavy oil. After the oil is worked out, the knock will again be noticeable.

The knock may be entirely remote from the engine proper and still appear as if it were occurring in the engine. It may not be the fault of your overhauling the car. It may be due to worn bearings on the camshaft, a loose flywheel, or a bent crankcase which is being struck by the connecting rod and the metallic sounds muffled by the oil sufficiently to give a dull thud.

Before proceeding any further, try to locate the exact place of the knock either by means of a stethoscope or by simply using a screwdriver for the same purpose. After you are reasonably sure of its location, try by means of elimination to determine on some specific cause and then make the necessary repairs to eliminate it.

Oakland Lubrication.

Recently I overhauled a six-cylinder Oakland and found, after I got thoroughly that the oil gage only registered up to $\frac{1}{2}$ pound at all speeds.

I tried adjusting the oil regulator screw, but this did not help it. Please explain this system and tell me what the trouble is in this case.—A. S. W., Va.

The lubrication system on the Oakland is known as the force-feed type.

The oil pump consists of two gears which mesh with each other in a housing. One of these gears is driven by a shaft from the camshaft by means of helical gears. The pump, as you know, is located near the bottom of the oil pan below the oil level.

Starting from the pump, the oil flows into a tube running the length of the engine to the front and rear crankshaft bearings as indicated on the diagram.

From the main oil line a pipe leads to the pressure indicator on the instrument board. Another pipe furnishes oil to the center bearing and the adjustment cham-

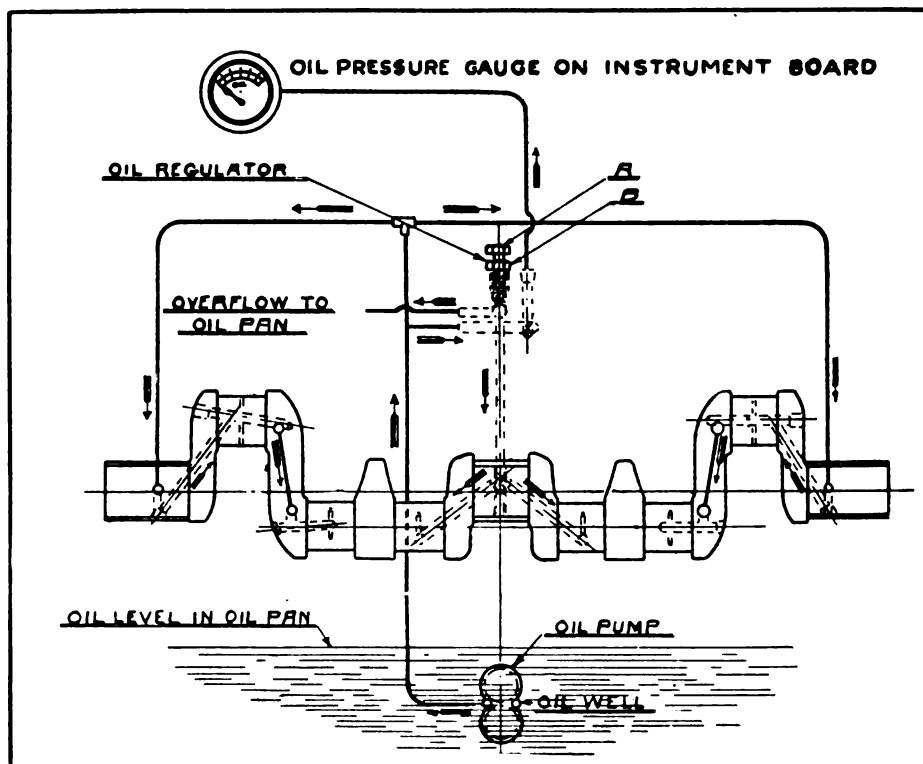


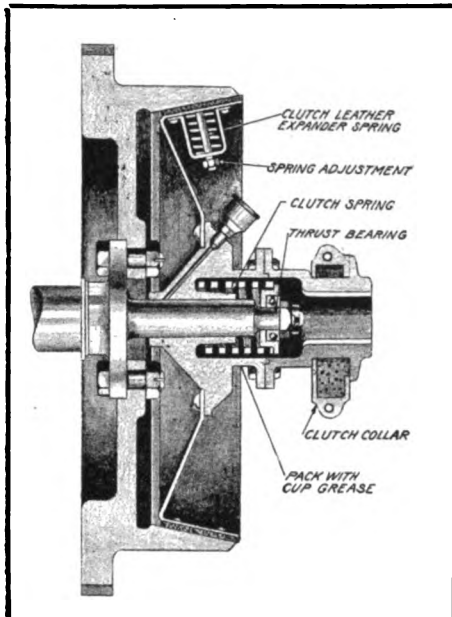
Diagram of Lubrication System on Oakland Showing Directions of Oil Flow.

piston slap or not, it is suggested that you fill the cylinder with very heavy lubricating oil, about one-eighth of a pint, and work it in by turning the motor over with the crank. Then start the motor and if the knock is not noticeable, it has been muf-

ber, and overflows back into the oil pan.

When oil has reached the crankshaft bearings, it is forced into grooves in these bearings and through holes drilled in the crankshaft to the connecting-rod bearings as shown in the illustration.

In addition to this, the camshaft bear-



The Dort Clutch.

ings, timing gears, wrist-pin bearings and cylinder walls are lubricated by oil thrown off from the connecting rods when in motion.

In order to obtain the proper oil pressure, run the engine until it has thoroughly warmed up, then with engine idling as slowly as possible, loosen nut *B*, adjust screw *A* until the hand of the oil-pressure gage registers between $\frac{1}{2}$ and one pound. When this condition is obtained, tighten nut *B*.

To locate the trouble which is causing a decreased oil pressure in the lubricating system, examine the gage and make sure that the indicator has not loosened from vibration or other causes and, consequently, is slipping on the shaft. If that is not causing the trouble and you are sure that the gage is otherwise in good condition, it is only a question of going over the entire system to look for dirt in the line or pump, or leaks at the joints. We suggest that you examine the line first and then the pump.

* * *

Radial Load

I would appreciate if you could find space in your Question and Answer column to publish the meaning of the terms "radial load" and "end thrust"?—S. G., Mass.

The meaning of "radial load," in the wheel bearings, is the weight of the car, whether empty or loaded, pressing downward. All cases of radial load cannot be

referred to as "weight," however; for example, on the pinion shaft, it is caused by the effort of the pinion to mesh with the ring gear teeth, rather than by weight.

When referring to worm bearings, the radial load is caused by pressure of the curved worm-teeth as they turn in meshing with the worm wheel. Radial loads affect all the anti-friction bearings at the point where they are installed, whether due to weight or to the power of the engine.

The term "end thrust" is applied to the force that acts directly along the axis rather than at right angle to the axis of the bearings. You doubtless have noticed when rounding a curve that the weight of the car pushes sideways against the wheels. There is sometimes provided on the pinion or worm two sets of bearings. One set takes care of the radial load, and the other the end thrust. Sometimes, however, a bearing is used that is so constructed as to take care of both forces at the same time.

* * *

Dort Clutch.

A Dort car was brought in for repairs on the clutch which was slipping. I examined the pedal to make sure that it fully engaged the clutch, also the leather which I found in good condition and not too oily. I tried adjusting the compensation plunger springs, but this did not help. I would appreciate a solution of this trouble.—R. S., Ohio.

Examine the pedal again and see that it has at least $\frac{1}{4}$ -inch clearance with the floor board when back in the engaged position.

Examine the clutch-cone hub and thrust bearings and see if they are well lubricated. The clutch collar is lubricated by means of a large grease cup as shown in the illustration. It sometimes happens that the grease tube becomes clogged with dirt and prevents proper lubrication.

The clutch coupling is packed with grease to lubricate the ball thrust bearing behind the clutch spring, and a small pipe plug is provided just back of the hub flange and ahead of the bronze clutch collar to keep this filled.

If this does not correct the trouble, examine the compensating springs and make sure that none of them are broken or the threads on the bolts worn so that no adjustment can be made, even though the nuts will turn.

To the eye, the leather may appear in good condition and not too oily, but in reality the condition of the leather may be causing the trouble. For that reason, disengage the clutch and with a funnel made of strong wrapping paper distribute some Fuller's earth on the entire surface.

If this procedure does not bring the trouble to light, remove the clutch and examine the cone for high rivets. The rivets should all be set so that the heads are well below the surface of the leather.

Tractor Data.

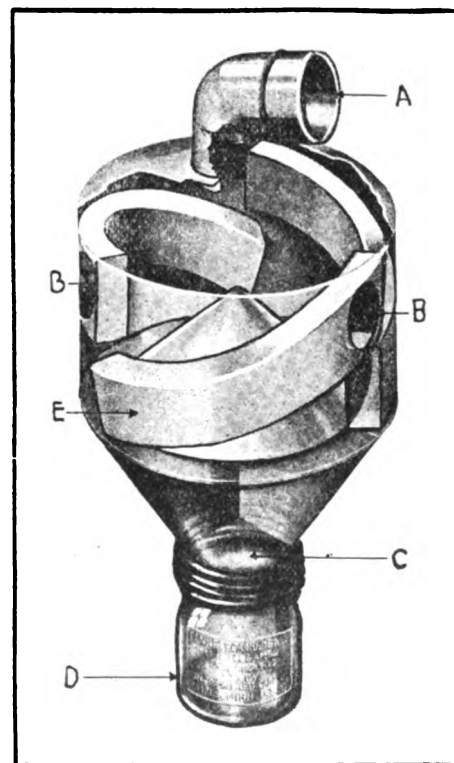
1. What is the tractor horsepower on kerosene of the Twin-City, 12-20 tractor?
2. Give the wheel base.
3. How much does it weigh?
4. This tractor is equipped with an air cleaner which I have carefully examined, but do not understand. Will you please explain it to me?—J. W., Iowa.

1. 12-horsepower on kerosene.
2. 84 inches.
3. Without fuel, water or lugs, 4,000 lbs.
4. The purpose of an air cleaner is to keep dirt out of the engine. In using the tractor in the fields, considerable dust is raised and if this were taken into the cylinders it would cause more or less wear on the piston rings, valves, bearings, etc., and would result in loss of power and necessitate frequent repairs.

The air cleaner is based on the principles of centrifugal force and the force of gravity. The action and construction can be clearly understood by reference to the illustration.

The air is drawn in by the suction of the engine through the openings, *B*, in the side of the cleaner. It then passes through the spiral tubes, *E*. These tubes are so constructed that the centrifugal force which they impart to the current of air and the action of gravity throw the dust into the trap, *C*, as the air changes direction and slows up in passing towards the opening, *A*, and into the carburetor. The cone seen in the center of the air cleaner is nothing but a baffle to prevent the current of air from carrying the dust from the trap.

The mason jar, *D*, should never be removed while the engine is in operation,



Air Cleaner Used on Twin-City Tractor.

and care should be taken not to loosen it. This would destroy the function of the air cleaner and affect the operation of the engine.

* * *

Welding Springs.

I would like to have you tell me how to weld automobile springs with the oxy-acetylene torch.

There are probably several methods by which you can accomplish this work, and there are no doubt several grades of metal used in the different springs, but we believe the following instruction will do for the average spring:

First, cut or grind the broken ends on the inside of the curve so the two when fitted together will form a V-shaped groove.

Then place the beveled ends together with the break resting upon the welding table and the other ends braced up with pieces of fire brick. Be sure the spring is in perfect alignment; this may be done with another leaf of the spring.

Make certain that the broken leaf cannot slip or sag. Start to weld by melting together one end of the groove at the same time adding a portion of the filler wire. Proceed in this manner the entire length of the groove. Employ a strictly neutral flame (be sure it is neutral at the start and that it stays that way) with a small size torch and tip. Keep it in motion and do not tarry over any part of the weld.

The main feature of welding springs is to prevent the metal from burning. But the sides and bottom of the groove must be melted when the filler is added. Use a spring steel filler without flux. Procure an old (or a new) coil spring with

the wire about an eighth of an inch in diameter. Get it red hot and straighten it by pulling the coils apart. This will make a good filler wire for welding springs; about as good as any you can get. When the weld is made allow it to cool; then re-heat it for about two inches of the leaf on each side of it. When the spot turns dull red carefully turn the job up on edge to cool and let it stand until cold.

* * *

Overland Wiring Diagram.

Will you please publish in the next issue of your magazine, the wiring diagram of a 1917 four-cylinder Overland.—M. P., Cal.

On one of these pages you will find the wiring diagram asked for.

* * *

Rattle in Generator.

While overhauling a car for one of my patrons, I noticed a peculiar sound, like a rattle, in the generator. Can this difficulty be overcome, or should I, in your opinion, suggest that a new generator be installed?—B. S. L., Mo.

We judge from the details in your letter that the trouble is due to broken generator bearings which allow the armature to strike the fields and cause the rattle. We would advise that you look after this before the car is driven again, otherwise it would probably be necessary to install a new generator.

* * *

Fordson Tractor Data.

1. What is the belt H.P. of the Fordson tractor?
2. How many plows are recommended by the manufacturer?
3. What is the wheel base?

4. How much does the tractor weigh?
5. What is the diameter and face-width of the traction wheels?
6. Give the bore, stroke and speed of motor.
7. What is the capacity of the kerosene tank?
8. What is the recommended plowing speed?—F. C. C., Ohio.

1. 22 H.P. rated at normal speed.
2. Two plows.
3. The wheel base is 63 inches.
4. 2,800 pounds without water and fuel.
5. The diameter is 42 inches and the width 12 inches.
6. Bore, 4 inches; stroke, 5 inches, and the speed, 1,000 r.p.m.
7. The capacity of the kerosene tank is 21 gallons. The tractor is also equipped with a gasoline tank of 2 gallons capacity.
8. The manufacturers recommend a plowing speed of two and a half miles per hour.

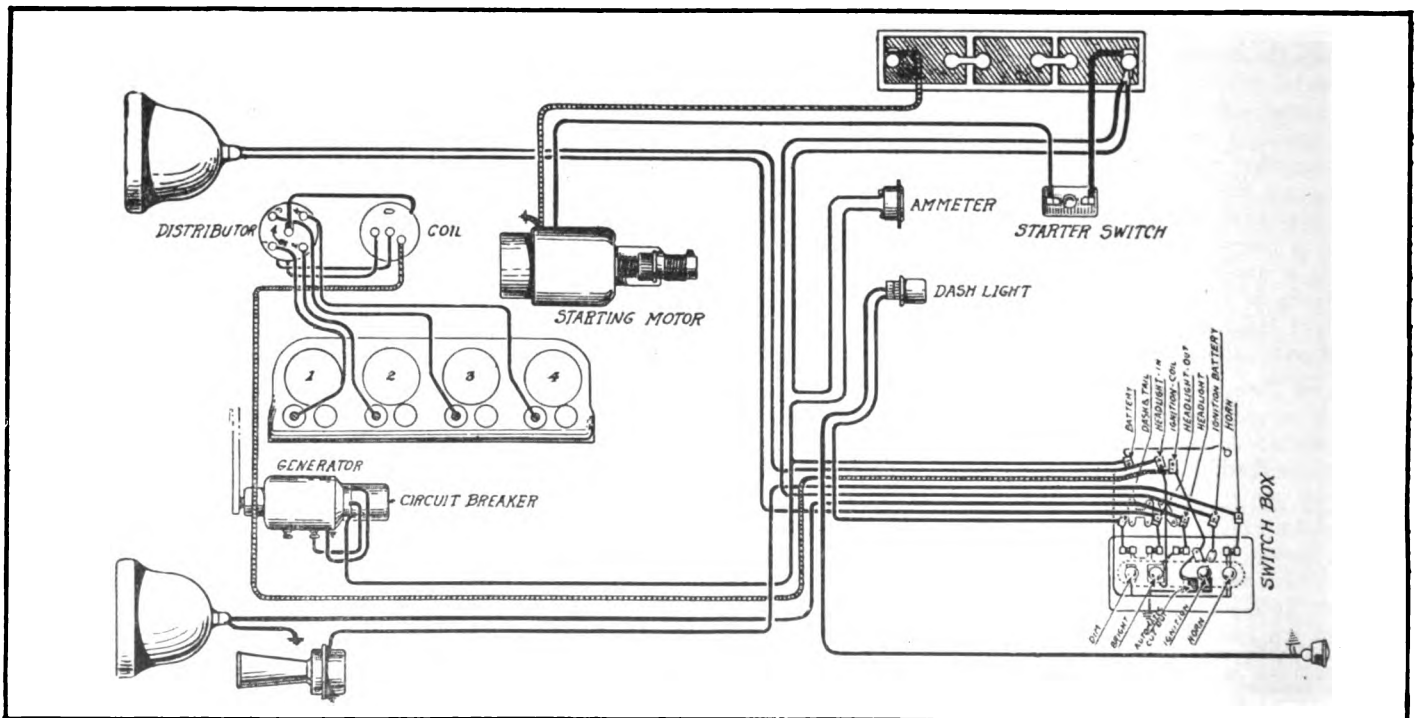
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Sparkplug Trouble.

A 1916 model, four-cylinder car has been brought into my shop a number of times because of trouble the owner has with the sparkplugs. He can get only ten miles to a gallon of gas, has run the machine 5,500 miles in 15 months, and the two center sparkplugs continue to carbonize and misfire.

I have tried several ways to correct this trouble, such as changing the carburetor; changing the end sparkplugs to center; trying the different makes of plugs; draining the oil out of cylinders and refilling with new oil so that it showed only one-fourth in the gauge, but they still carbonize.

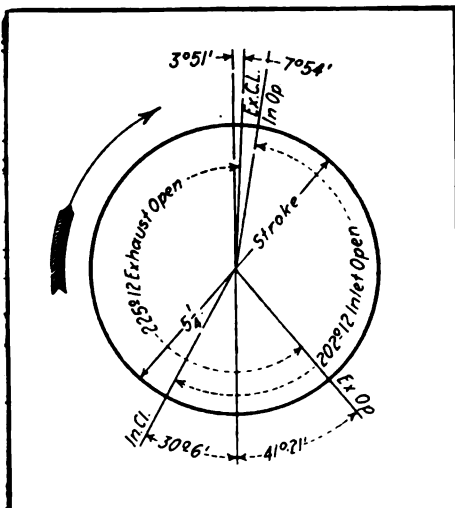
I have also ground the engine valves twice, but with no better results. Will



Wiring Diagram of Four-cylinder Overland.

you be good enough to suggest the cause of this trouble?—S. M.

Yes, it is possible. For instance, if the end of a spark plug is sometimes oily the indication would be that there is too much lubricating oil or possibly leaky piston rings. If there is a deposit of black, soft soot you will quite likely find that



Overland Valve-timing Diagram.

too much gasoline is being fed to the cylinder through the intake, which will, of course, cause too rich a mixture, the reason for which may be either that the carburetor is incorrectly adjusted or there is an air leak in the intake manifold.

If the ends of the plugs are both oily and sooty, you will in all probability find that the valves are leaking, as this will permit drawing into the mixture burnt gases which cause poor combustion and a decreased pressure in the cylinder.

* * *

Timing Overland Model 82.

I have a six-cylinder Overland, model 82. How can I determine whether the setting of the valves is correct?—A. C. M., Ohio.

To properly determine whether the setting of the valves is correct, proceed as follows:

Open the priming cocks over all of the exhaust valves to make the turning of the motor easier. Turn the flywheel to the left until the mark 1-6 D-C is in line with the guide mark on number 6 cylinder. The pistons of 1 and 6 are now at their highest points in their cylinders, or on upper dead center.

About 1.07 inches to the right of the mark 1-6 D-C will be seen the mark 1-6 I-0. Turn the flywheel to the left until this mark is lined up with the guide mark on the motor. The inlet valves of either cylinder 1 or 6 should start to open. If cylinder 6 starts to open, turn the flywheel one complete revolution until the mark 1-6 I-0 again appears on top and in line

with the guide mark. No. 1 inlet valve should now begin to lift from its seat.

Turn the flywheel a little more than half a revolution until the mark 1-6 I-C appears on top and in line with the guide mark. In this position the inlet valve should be closed and there should be just enough space between the valve stem and the push rod so that a thin visiting card can be placed between them.

Next test the exhaust valve by bringing the mark 1-6 E-C in line with the guide. When the flywheel is in this position, the exhaust valve should be closed. If the timing is found to correspond to the marks on the flywheel the valves are properly timed.

Cylinders 2, 3, 4, and 5 can be checked up in the same way. A diagram showing opening and closing points of valves graphically is outlined in the accompanying illustration.

* * *

Noisy Transmission on Hudson.

An owner brought in a 1914 Hudson 6-40 which was very noisy in the transmission gears and asked me to eliminate the noise.

I carefully examined the transmission and found that the noise was due to the slight misalignment of the shafts through worn bearings. I explained the condition to the man and gave him an estimate on the job of installing new bearings. He does not want to spend that much because he is planning to trade the car in for a new one and asked me to quiet them without renewing the bearings. Would you advise me how this can be done?—C. P. E., Orange, N. J.

Extra heavy oil with a handful of graphite is perhaps the best lubricant for transmissions and differentials. This, however, means that a special heavy transmission oil will have to be used, because the ordinary heavy motor oil does not have sufficient body.

A very good and cheap transmission lubricant can be made by mixing half grease with half oil, light or medium, and about two handfuls of graphite. Grease alone is not advisable because the gears wear a path in the grease and prevent it from lubricating properly. In the winter time it is best to use oil alone.

Tests made on a gearbox by The National Physical Laboratory, show that with the transmission filled completely with oil the efficiency of the direct drive is about 74%, when one-half full of oil the efficiency is 97.5%. And it is evident that had grease been used the efficiency would have been lower still.

This shows that in order to cut down the unnecessary power losses it is best to fill the transmission only about half full and when it can be obtained it is best to use a mixture of heavy oil and graphite. The mixture of oil, grease and graphite mentioned above produces a good heavy transmission oil after a few days of operation.

Farm-Electric Plant.

1. What is the bore and stroke, and the horsepower rating of the Lalley light farm-electric plant?

2. What kind of an engine has it? Please give details.—J. F., N. D.

1. The bore is 2½ inches; the stroke two inches; and the horsepower rating is 1½ at 1,800 r.p.m.

2. The engine used on the Lalley light plant operates on the two-cycle principle; that is, it has a power impulse every revolution. During the two strokes of a complete revolution, the four operations of intake, compression, explosion, and exhaust occur.

The engine has only three moving parts—the piston, connecting rod and crankshaft. It has no valves and, consequently, no camshaft and push rods. The gas is let into and out of the cylinder through portholes as they are uncovered by the piston. These parts take the place of valves used on a four-cycle engine.

The engine is water-cooled by thermosiphon circulation from an ordinary tank. It has no radiator.

The piston has three rings at the top and one at the bottom, and has a baffle plate as shown in the illustration to prevent the incoming gases from mixing with the burnt gases and to facilitate the exhausting of the burnt gases.

The flywheel has fan blades which are cast integral with it to help keep the generator cool.

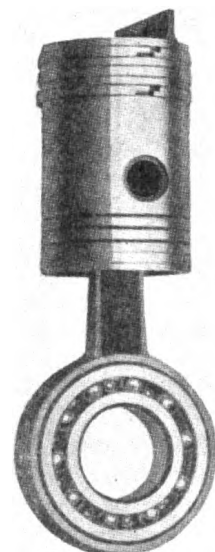
The bearings are all extra large annular ball bearings pressed on the crankshaft. The same kind of bearings are also fitted in the connecting rod.

The carburetor is of the float-feed type and is cast integral with the base.

The ignition is obtained from the standard high tension magneto direct connected to crankshaft with a flexible coupling.

This plant is equipped with a centrifugal governor running in an oil bath. It acts through a rocker arm directly on the balanced plunger throttle which governs the combustion mixture.

The piston and the connecting rod bearing are lubricated by putting oil in the gasoline tank, while the governor and crankshaft bearings run in oil supplied through an oil cup in the side of governor housing.



Piston and Connecting Rod Construction.

The Law on Emergency Accidents

Explosion Starts a Fire in a Garage—A Fellow Worker Tries to Rescue a Pal and in the Excitement Is Hurt—Insurance Company Refuses Him Compensation—Under the Emergency Law Is He Entitled to Compensation?

By Chesla C. Sherlock

Accidents are bound to occur in the best regulated shops, no matter how many precautions are taken to avoid them. This is the inevitable result of the presence of men and dangerous materials; and they occur with an astounding frequency. Something like 48,000 accidents occurred in the state of Iowa last year! Not long ago they had one at the Sanderson garage that illustrates the tendency and what they often lead to.

Jack Pearson, a returned veteran, had been put to work in the repair shop and had worked but two weeks before he lost his life.

A customer brought in a car with a leaky gas tank and wanted it repaired. The task was assigned to Jack, who had had a lot of experience in such matters overseas. He took the tank off the car, thought he had emptied all of the gasoline, and carried it to his bench. It was necessary to use a little solder in order to fix the hole in the tank.

While he was using his torch to heat the soft metal, a loud and powerful explosion took place, which not only killed Jack and severely burned one of his fellow workmen, but created a fire that all but destroyed the Sanderson shop.

At the time the explosion took place, Fred Smith, a boy who had been employed to deliver tubes and tires to customers with his motorcycle happened to be standing in the office talking to the head clerk.

He was a great pal of Jack's and when the explosion took place, he rushed out into the repair room in an effort to rescue him. But he was met by a solid sheet of scorching flame which drove him back.

In his fevered excitement the thought flashed into his mind that the fire department must be summoned at once. He did not run to the telephone and call "central," as might have been expected. He suddenly remembered that there was a fire box across the street.

So, acting on the impulse, he dashed out through the front door and across the street. Just before he stepped up

to the curb, a delivery truck whirled around the corner, struck him and severely injured him.

The fire was, in due time, put out and Jack removed to an undertaking establishment. The other workmen who had been injured and burned were taken to the hospital.

It seemed to the "boss" that things had happened all at once, and he was unable to comprehend just why "luck" should have it that Fred should be injured across the street when he had suffered such a loss in the shop. But events sometimes move that way in spite of human understanding.

In the course of time he sent in a claim for the injured workmen to his insurance company and for Fred Smith. They had all been injured as a result of the same accident, and it never occurred to him that there would be any question about Fred being entitled to compensation.

Within a few days the adjuster for the company was in the office of the Sanderson garage, making an investigation.

"I'm satisfied of our liability upon all of the cases except that of Fred Smith," he said. "I am not quite clear on it. Will you explain just what connection it had with the explosion?"

Sanderson told him in detail just how Fred received his injury. The adjuster pondered a moment.

"But," he protested, "Fred was outside the scope of his employment when he went across the street to send in that fire call. The injury did not 'arise out of and in the course of' his employment, which was to deliver tires and tubes in response to orders. He was on a private mission of his own when he rushed across the street to send in that fire call, aroused, no doubt, by his anxiety for his friend; but that simple little rush of his across the street carried him outside the scope of his employment."

Sanderson was not convinced.

"He was employed, it is true, to deliver tires and tubes, but he was a member of this organization and it was his duty to do all that he could to preserve it against loss. It is natural

to suppose that any employe, or stranger, for that matter, in case of fire, would rush across the street to give the alarm. I think he is entitled to compensation and that it is up to you to pay it."

The adjuster shook his head.

"I'd like to do it, Sanderson, but I'm afraid the law doesn't read that way. You remember the famous case that took place down state? An employe attempted to kill a cockroach, lost his balance and fractured his skull. The commissioner held that he was outside of his employment when he rushed after that bug and refused to allow us to pay compensation to the dependents."

The result of the controversy was that when Fred Smith recovered from his injuries he brought suit against the insurance company to recover compensation.

In the course of time, the matter came up for hearing before the arbitration board composed of the commissioner and two others, representing the parties.

The arbitration board found for Fred, and the commissioner wrote the following opinion, which the others signed with him:

"It is true that Fred Smith was technically outside the scope of his employment when he rushed across the street to send in a fire call. He was not even on his employer's premises and the accident that caused his injury did not arise out of the duties he was required by his employment to perform.

"But in this case, a sudden emergency was presented upon which he acted, presumably with the idea of best promoting his employer's interests. And while in the course of that intention he suffered the loss and impairment of his earning capacity. Under the emergency rule of law, we hold that he is entitled to compensation."

It is hardly necessary to add that this is a general rule of law. If a workman acts in a sudden emergency, even though wrongfully, he is entitled to compensation.

The COFFIELD TIRE PROTECTOR

makes-



**COFFIELD
PROTECTOR**

any tire wear longer

DEALERS Who Sell Them ARE Most Enthusiastic—as are those who use them

Most Every Tire nowadays is well built and will give thousands of miles of wear IF—

You are fortunate enough not to damage the Tire by stone bruises, running flat from a puncture or something of the kind.

But how many tires have to be discarded because the fabric is damaged long before the tread is worn through to the breaker strip!

The "Coffield" Protector is not a cure-all and is not intended to be put in damaged or worn out tires. It is for use in NEW TIRES or TIRES THAT ARE SOUND. When used in this way the Coffield Protector will make any tire deliver one mile of service for every mile of wear there is in the tread, BECAUSE:

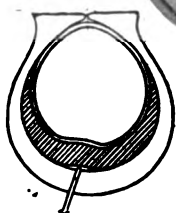
It prevents punctures,
Eliminates Stone-Bruises,
Reduces Blow-Outs to a minimum.

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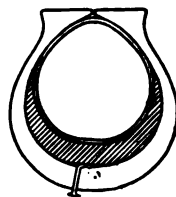
The first cost is the only cost, because the "Coffield" is used over and over again. Put it in a new tire—wear the tire out—then put it in a new tire again. It will save its cost on the first tire you put it in by the extra wear it causes the tire to give—saying nothing about the trouble saved from punctures and blow-outs. One set of "Coffields" will outlast all the tires ever used on any car.

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Timely Cold Weather Precautions

There Are Two Kinds of Winter Automobile Owners, Those Who Use Their Cars and Those Who Store Their Cars—Do You Know the Cold Weather Precautions for These Classes?—A Few Reminders That Will Help You

With the approach of winter weather comes a natural loss of interest in the automobile and its use. For the average owner of an automobile, the touring season is over, and rather than keep the car idle most of the winter or experience considerable trouble on cold days when occasionally using the car, he will decide to cover it and let it be until the spring.

It is the garageman's work to convince the owner that the bright, brisk days of winter are as pleasant to ride in as the warm, brilliant days of summer, if the right precautions are taken and the necessary preparations made.

This can be done by personal advice and service, and by the advertising of winter accessories that will make the coldest day no more uncertain for driving than the warmest day of summer.

The sooner the average owner shows an enthusiastic interest in winter driving, the sooner will the garage trade become an all-year business. It is part of the garageman's educational work to inform, advise, advertise that winter driving imposes no unusual difficulties if the proper preparations are made.

However, no matter how convincing may be the arguments in favor of all-year usage of the automobile, some will have their own way and will store their cars for the winter. For this class, the garageman must know what to anticipate in order to properly advertise and sell the things necessary in laying up the car for the winter and how to keep his repair shop busy.

In addition to these two classes of automotive users—the class that use their cars and the class that store their cars—we have the tractor and the farm-electric owners, and they should come in for a little consideration during the winter months.

For the owners who intend to use their cars throughout the winter, it is well for the garageman to remember that during cold weather it is essential to conserve the heat generated by the motor so as to facilitate vaporizing the gasoline in the carburetor and thus produce a mixture in the cylinder which will be easily and completely ignitable. This can be accomplished by using a hood cover, and in real cold weather disconnecting the fan for part of the time. Furthermore, the louvers should be covered with a piece of cardboard fastened on the inside, and the carburetor and

intake manifold shielded from the direct current of cold air from the fan by fastening a piece of tin so that the air is deflected on the cylinders.

In cold weather, gasoline will not combine with cold air to form an explosive mixture; that is, the vaporization of gasoline is poor and for that reason, when starting the engine, it will be necessary to restrict the amount of air by using the choke or closing

tures. Disengage the clutch when cranking, for this eliminates the drag of the transmission gears through solidified oil.

The solidifying of the lubricants is a point that must be taken into consideration during the cold months. Oil congeals and cannot flow as fast when it is cold as when it is thoroughly warmed up. For that reason, racing the motor after starting, particularly after it has been standing in the cold,

is very apt to result in burned-out bearings. This is because the oil did not reach the bearings on time, due to its congealed state. It is easier to warm up the motor with the throttle slightly opened and the hood cover on than by racing it violently immediately after starting.

At the outset of the freezing weather, drain the water from the circulation system and fill it with an anti-freezing solution. A simple solution of alcohol, either denatured or wood alcohol, by volume to that of water for different temperatures is given by the curves, *A* and *B*, Fig. 1.

To find the percentage of alcohol necessary to prevent freezing at a certain temperature, locate that temperature on the bottom of the graph and from there with a pencil run vertically until you strike the curve, either *A* or *B*, depending on whether you intend to use denatured alcohol or wood alcohol. From there proceed horizontally to the left and obtain the percentage of alcohol by volume necessary to prevent freezing at that temperature.

If, for example, in your locality the temperature averages around zero, and you have a car whose cooling system holds four gallons of water, to determine what percentage should be alcohol, say wood alcohol, proceed as follows: On the bottom of the graph locate zero degrees Fahrenheit and with a pencil run vertically until you strike the curve *B*, horizontally until you strike the vertical line at the edge of the graph.

This point is about two-thirds of the distance between 20 and 30, and two-thirds of 10 added to 20 gives the percentage of wood alcohol to prevent freezing at zero degrees Fahrenheit. Two-thirds of 10 is 6 $\frac{2}{3}$, or say 7. Hence the percentage of wood alcohol is 27.

Multiply 27 by 4 (gallons) and divide by 100. This gives 1.08 gallons of wood alcohol and 2.92 gallons of water necessary in your cooling system to prevent freezing

The Winter Outlook

With the approach of cold weather motorists will begin to harbor thoughts of putting away their cars for the winter. Many of them, to whom it is more or less an annual event, have already decided on that course of action. Others are still in the balance as to whether to store their cars or not, while many will use their cars throughout the winter. Nearly all, however, are consulting their almanacs to find out what the future holds in store as to variety of winter weather.

For the garageman we have taken out our hiemisphere and looking into the depth of its mysterious foretelling we see a winter as winters are, cold and snappy with its intermittent bright, warm, sunny days and its frigid, stormy periods of snow and sleet.

Then looking closer with straining eyes we see the outline of a stream-line like mass of proportionate material, beautiful, sturdy, anxiously yet patiently reciprocating, slowly become clutched in the hand of a cold, merciless figure.

Gradually the hum of motion becomes intermittent as the mass of iron chokes and strangles, the colorless liquid that flows through its recesses solidifies, the yellowish fluid that furnishes balm to the action of wear becomes thick and pasty, the storehouse of energy becomes impotent, the comforters sleek and forlorn looking and the thing as a whole loses its sturdiness, its life, its usefulness.

In this we see the garageman's work, that of protecting this utility for the man who wants to storage it and that of preparing it against the aggressiveness of this colossus of winter for the man who uses it.

the air valve. Very often it may even be necessary to prime the motor, and consequently the garageman cannot urge the motorist too strongly to install a primer for the winter. To facilitate starting, accelerate the motor to draw a full charge into the cylinders before shutting off.

If the engine does not start after a few seconds of cranking, stop using the motor and determine the cause. It takes considerable more power to crank an engine when cold because of the added resistance of friction and the drag of oil and grease which becomes congealed at low tempera-

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August 11, 1919.

The Stenman Electric Valve Grinder Co., Inc.,
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Worcester, Mass.

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Replying to your letter of August 9th, would say it affords us much pleasure to send you our check to cover the cost of the Electric Valve Grinder sent to us for trial a short time ago.

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HHH/FM

Yours very truly,

HALL MOTOR COMPANY,

Per *Harry H. Nace*

The moral from the above letter, is that you insist on getting a "Stenman" and accept no other. "As good or better" has not yet been made. Your jobber can supply you—if not—write to us. Circulars on request.



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Patents 876,449
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"Will Pay 300%"

The Stenman Electric Valve Grinder will pay 300% yearly on the original cost where it is used to grind but one set of valves a week. If used more the returns will be proportionately greater.

"They Serve Best Who Are Best Equipped To Give Service"

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Price \$40.00—F. O. B. Factory

Stenman Electric Valve Grinder Co.

Makers of the Original Electric Valve Grinder

41 Southbridge St.,

Worcester, Mass.

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at zero degrees Fahrenheit. It is not necessary to be so exact, and hence one gallon of wood alcohol and three gallons of water is sufficiently close.

Remember, alcohol evaporates more rap-

The curve in Fig. 2 gives the freezing temperatures of the battery solution corresponding to different specific gravities or different degrees of charge.

If the battery should become discharged from allowing the car to stand with lights burning, ignition switch left on or from any other cause, it should be given a recharge immediately.

Besides its effect on gasoline, cold makes all lubricants less fluid, and for that reason it is best to replace your lubricating oil with a lighter one for the winter months.

The oil in the crankcase should be renewed fre-

tribute the wear. Do not apply them too tightly or they will cut the tread and render it useless in a short time.

The finish of the car, especially if the car is new, should have special attention in cold weather, or it will lose its luster. Avoid, as much as possible, sudden changes in temperature. Enter and leave the garage only after having the door open for a few minutes, so as to bring the temperature down or up gradually rather than suddenly.

Snow and icy mud must be cleaned from the car at the first possible opportunity to prevent serious damage to the finish, and the exposed metallic parts should be kept as dry as possible to prevent rust.

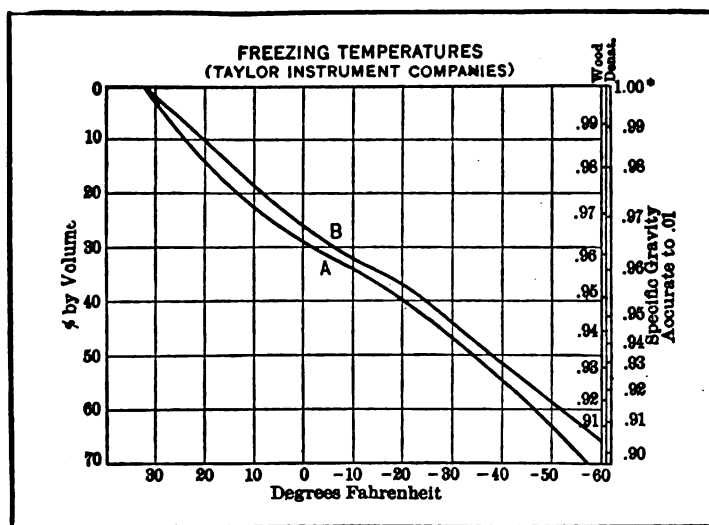
In general, due to the low efficiency of lubrication at low temperatures, the brakes and the steering device should be frequently lubricated and examined to see that they work properly.

For the class of owners who intend to put away their cars for the winter, either in their own private garage or in your garage, it is best that you be reminded of the essential things that have to be considered when storing a car.

If you have sufficient room in your garage for storage purposes, try to have the owner store his car in your garage for the winter and at the same time obtain the work of overhauling it some time during the slack period.

In storing the car there are different degrees of preparation from the preparation that includes only the essential precautions to that which includes various degrees of overhauling, depending on the condition of the car, and which leaves the car ready for operation in the spring. We shall, however, only point out the essential precautions that have to be taken into consideration when preparing a car for storage.

Before preparing the car for storage, the



Percentage of Alcohol by Volume for Different Temperatures.

idly than water and hence has to be replenished from time to time.

A solution of alcohol, glycerine and water can also be used in the following proportions:

For temperature not lower than 5 degrees below zero:

Alcohol.15 per cent
Glycerine.15 per cent
Water.70 per cent

For a temperature of not lower than 15 degrees below zero:

Alcohol.17 per cent
Glycerine.17 per cent
Water.66 per cent

Alcohol should be added occasionally to make up for evaporation. The glycerine does not evaporate. Glycerine is slightly injurious to rubber, but, all things considered, a solution of alcohol, glycerine and water is very satisfactory.

Do not use solutions containing calcium chloride or any alkaline solution, because these are injurious to the metal parts. Some also use kerosene in place of water, but this practice is injurious to the hose and, besides, very dangerous.

If the radiator should become frozen, do not run the motor until full circulation has been restored. Thaw it out gradually by the application of hot cloths and the addition of hot water. If thawed out too quickly it is liable to crack the radiator in several places. This also applies to the cylinders when frozen. It is best to move the car, when frozen, into the garage and let it thaw out gradually, but when this is not possible, thaw it out slowly rather than rapidly to prevent cracking due to sudden expansion.

When the temperature falls considerably below freezing the battery should be kept fully charged. If it is fully charged there is no possibility of the solution freezing.

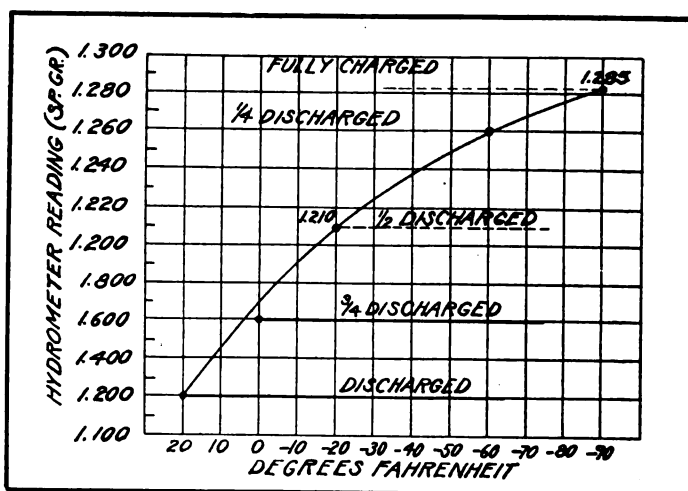
quently on account of the water of condensation which collects in the crankcase and which is liable to freeze and cause trouble.

The congealed effect of low temperature is more pronounced in greases than in lubricating oils and there are some grades of grease which actually freeze when subjected to temperatures a few degrees below zero. For this reason, extra heavy lubricating oil should be used in the differential and transmission, or the grease thinned with light oil or a pint of kerosene.

In the lubrication of the chassis, the hard grease should be replaced with soft grease, or hard grease mixed with oil, or only good extra heavy cylinder oil should be used.

Cold weather does not affect the tires any more than warm weather, and outside of keeping them properly inflated, they will give little or no trouble. Small holes in tires, however, will cause trouble on account of mud and ice accumulating, freezing and thawing. Special care should be taken to see that these cuts are kept repaired.

Under severe conditions, when the roads are covered with snow or ice, tire chains will have to be used on the rear wheels. The chains should be properly adjusted so that they can shift around over the tread and dis-



Freezing Temperature of Battery Solution for Degrees of Charge.

most important thing to take into consideration is the storage space. This space should be dry, preferably with some heat, and with a subdued, even light from all
(Concluded on page 42.)

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The Three-Piece Snap Piston Ring



Two sturdy square cut rings supported by an inner ring of angle beam construction—the construction used in heavy structural work when great strength is needed. The three rings are assembled, ingeniously pinned, to function as a single ring.

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Welding, Cutting and Brazing Practice

Method of Repairing a Motorcycle Cylinder with the Oxy-Acetylene Torch—
Special Precautions: in Pre-heating to Prevent Cracks—Adding the Metal
to Facilitate Machining—Handling the Torch to Obtain Good Results

By David Baxter

A motorcycle is close kin to an automobile, so it may not be out of place to break into the series of automobile articles with a discussion on the welding of a motorcycle casting.

These castings and other cycle parts are liable to come to the garage welding shop at any time and it may be worth while for the welder to have some knowledge of how to handle them. Therefore, this month we will discuss the methods of making this class of repairs, choosing for the subject an air-cooled engine cylinder.

There is not much difference between motorcycle and automobile welding except as a general rule the cycle parts are lighter, which calls for a little more skill in the welding of the parts that require machining, especially the parts made of cast iron. Parts made of cast iron should be welded with soft iron in order to facilitate the machine work.

To make a weld of cast iron where the metal is thin, requires considerable care in melting and fusing the filler or it will be so hard as to be almost impossible to file or drill. Nearly all motorcycle parts are of thin metal which is the main reason why considerable skill is essential on this class of welding.

The welder must use the proper equipment and supplies, and he must manipulate them correctly or he will produce a perfectly good weld that is worthless. This paradox has been the downfall of many beginners on other classes of work beside cycle welding. They make the weld all right, but the machinist howls.

Which means that the weld must be soft enough to drill as well as solid enough to hold; this sometimes calls for pretty clever work on thin cast iron jobs like the one embodied in the cylinder shown in the illustration.

Of course, there are a great many other parts to a motorcycle, and they do get broken too, but they are for the most part made of steel or wrought iron, which are

easier to weld. Some are welded with Norway iron and some with bronze, both of which produce a weld easily filed or drilled. However, let us not go deeper into that but proceed to the preparing and welding of the cycle cylinder.

First, a brief description of the casting and what is to be done to it: To simplify matters let us suppose that the job has arrived at our shop and we are going to repair it. It is a common single cylinder of the air-cooled type with two corners of the flange by which it is fastened to the crankcase broken off. These corners are broken close to the cylinder so there can

while we are proceeding with the welding.

The metal in this cylinder is fine-grained gray iron, probably soft enough when poured into the mold, but due to the shape and chilling quality of the mold, it is liable to be somewhat hard now, or at least have a thin skin of hard iron outside of a softer body.

The first thing to do with this job is to get it ready to weld. There is not much to do along this line; however, preparation is one of the main things on many kinds of work. The surface of the fracture is cleaned thoroughly with gasoline and a stiff brush. All grease and dirt is

removed, both from the fracture and from the vicinity of the flange. This is to prevent any foreign matter from entering the melting weld, where it might cause lots of trouble, by preventing fusion, forming pin holes, or worst of all, cause hard spots in the weld.

After the fracture is cleaned, the inside of the cylinder, or the bore, is packed full of asbestos scrap paper to prevent the preheating fire from coming into direct contact with the surface of the bore,

where it might by overheating cause rough spots. The scrap paper keeps the flame out and yet does not retard expansion or contraction of the cylinder when it is heated.

Next, we place the cylinder upon a couple of pieces of fire brick as shown in Fig. 1. One piece of brick is placed under each end of the cylinder, to raise the cylinder high enough above the table to permit a gas burner to be inserted beneath it. This arrangement causes the preheating flame to envelop the whole casting after the gas burner has been lighted. The whole contrivance is located upon a brick-top welding table which is much handier to work on than the floor, since the torch operator may move about during the welding without loss of time.

This cylinder is preheated with natural gas, which is not absolutely necessary if

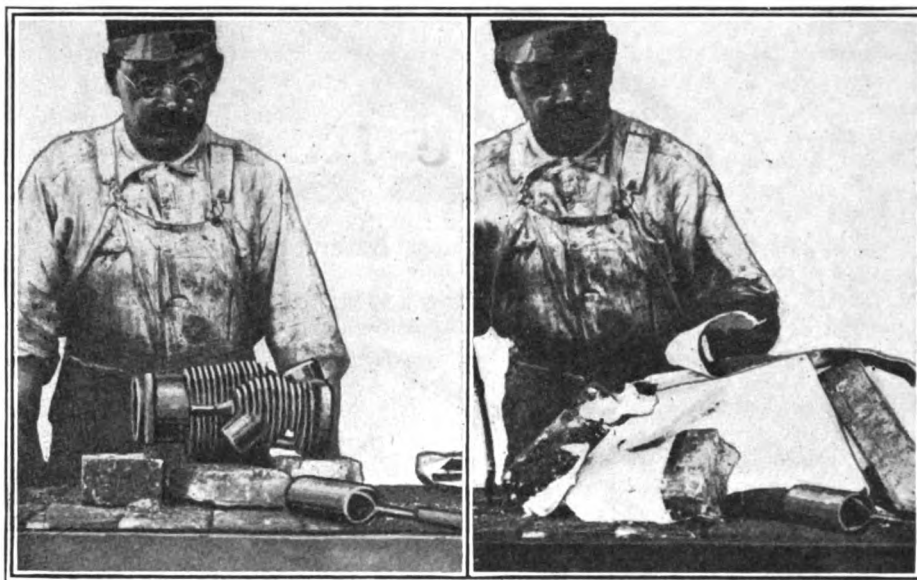


Fig. 1.—Position of Cylinder and Preheater.

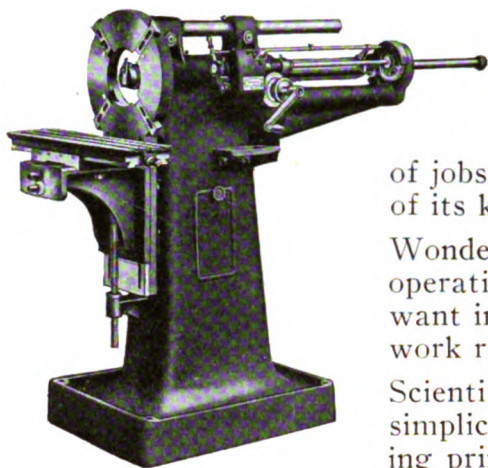
Fig. 2.—Arrangement for Confining Heat.

be no other way of repairing it but to weld it; in other words, the casting would have to be thrown into the junk pile if the welding torch had never been invented.

The broken corners include the bolt holes, but the pieces are so small that it is better to build up new corners in preference to attempting to weld on the old ones. In fact, there is not enough metal in the section between the corners to properly prepare it for welding. So the best thing to do is to throw the broken corners away and build new ones with the torch and filler rod, after first taking accurate measurements from which the new holes can be correctly bored.

There is one rather serious objection to welding by building on the new corners—the fact that it is difficult to get the metal soft enough in such a thin section to drill the new holes. Let us keep this in mind

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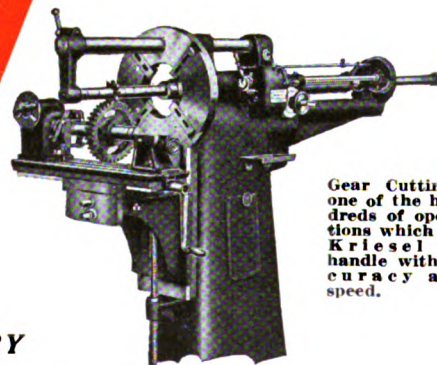
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the welder has an oil burner, or the preheating can be readily accomplished with a charcoal fire. In this event, the only change in the arrangement will be to set the casting up a little higher in order to have room for a grating, or for a charcoal basket beneath it. A basket is best, perhaps, because the charcoal may be ignited more easily in it.

The charcoal should be burning briskly and arrangements made for air to come up through it before placing the basket under the cylinder. Then the charcoal should be piled up on both sides of the casting about half way. When this charcoal is burning well, the whole thing should be enclosed in some oven-like device to confine the heat, or the casting may be covered with pieces of scrap asbestos paper, such as was done on our particular cylinder. This part of the process is illustrated in Fig. 2.

After the gas burner is lighted and burning correctly, place strips of asbestos paper over the burner and casting, arranging them so they will lap and entirely cover the job. Secure them with pieces of brick to prevent accidental uncovering of the casting. Punch several small holes in the covering near the top to permit a circulation of the heat.

Then allow the job to heat for about half an hour under cover, during which time the heat condition is ascertained by peeping beneath the strip of asbestos placed along the top of the pile. The time of heating varies according to the intensity of the preheating fire. However, when the casting is red hot all over, it is ready to weld.

The asbestos covering is arranged both to conserve the heat and to protect the operator while welding. It also prevents cold blasts of air from striking the cylinder at a critical moment. Strips of tin or a brick oven would serve the purpose about as well.

The preheating is for the purpose of causing the metal in the cylinder to expand before the welding flame is applied. If the job was not expanded, the intense heat of the welding flame would cause it to expand suddenly and this might result in an open crack. At least, the casting would crack when the weld contracted as it cooled, if the cylinder had not been preheated. Therefore, the idea of preheating is to cause the casting to expand as a whole and to contract evenly throughout. The asbestos covering serves to further this by confining the heat and causing it to radiate slowly.

It is not absolutely essential to get the job red hot, but it is considerably safer for the beginner. *But he should be careful not to get the cylinder white hot or even a bright red because the metal tends to carbonize, thus becoming lifeless and brittle.* Then, too, the white heat often causes the casting to distort. And if the white heat is sustained, it causes the metal to swell

or enlarge; which is, in effect, expansion without corresponding contraction.

As soon as the casting is red hot, the welding flame is applied through an aperture formed in the covering by pulling aside a small piece of asbestos directly over the broken section. At the same time the flame is applied, a rod of filler metal should be taken up. Play the flame in tiny circles upon one end of the broken flange.

While this section is melting, the filler rod is introduced and starts to melt. When the weld starts melting, the filler rod is placed in contact with it. The two are mixed together with a twisting motion of the filler rod. A bit of new metal is thus added to the broken flange. This bit should be about half an inch long by an eighth high. Another half-inch is then fused to the flange and to the preceding half-inch. Then another is added to the second, to which another bit is fused.

The entire length of the break is covered in this way, with a layer approximately an eighth of an inch thick. Then the flame and filler rod are swung back to the start and another layer added like the first,

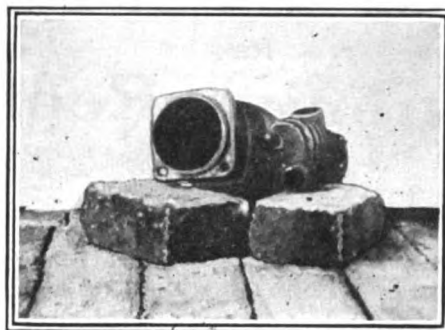


Fig. 3.—The Welded Motorcycle Cylinder.

being careful to see that it fuses perfectly. To do this it is necessary to melt the weld to the depth of the first layer; or in other words, the melted metal of the first weld is an eighth of an inch deep before adding new metal of the second layer.

The sides of the layers may be made smooth by shooting the welding flame down the side of the weld, blowing the metal in place. But care should be taken to leave enough surplus metal on the lower side for machining purposes.

The whole flange is built up a layer at a time. Each layer being knitted to a previous one by twisting and churning motions of the filler rod. An extra layer is melted on top of the last layer to furnish metal for cleaning the edge of the flange.

When adding the filler metal, we must do everything possible to keep it soft enough to machine. The first thing to do is to select a soft filler rod. And, unless you have the rods analyzed, your only protection is the manufacturer's word. Buy the rods under specification from a reputable dealer. He is bound to sell you soft rods if you demand them, otherwise he may never sell you any more.

Another thing to help produce a soft

weld is the choosing of the proper size filler for the job. A rod too large requires too long to melt, thus endangering the weld to overheating. If the rod is too small, the metal will be partially destroyed by the flame before the weld is ready for it. Both of these effects cause a poor weld, filled with hard spots, often all hard.

The selection of the proper size torch and tip for the work is perhaps only repeating the facts about the size of filler. A tip too large will furnish too much heat for the weld and filler—the opposite being true for a small tip. In conjunction with the proper torch and filler, a good flux should be employed at frequent intervals throughout the welding.

The welder should not be satisfied with soda ash, borax, salamoniac or any flux just because it is handy, on special jobs, but should keep a stock of flux made expressly for cast iron. One that is compounded by expert chemists who know how much of the different ingredients to add to the mixture in order to obtain the desired result should always be used. A cast-iron flux made to assist in producing soft welds should be used on this thin work.

A flux is essential on all cast-iron jobs and especially on thin castings like the motorcycle cylinder. If the right amount is correctly employed, the flux cleans the melted metal of much that tends to cause hard welds.

When the torch filler and flux are as they should be, the next thing for producing soft welds is to manipulate them correctly. The torch should first be regulated so the flame is strictly neutral, a flame consuming equal parts of oxygen and acetylene. This is the best that can be done with the flame; should either gas be in excess, it is a detriment to cast-iron welds and will undoubtedly produce a hard or spotted weld. Therefore, the flame should be started neutral and kept that way all through the welding; the welder should always keep an eye on it because several things, or perhaps I should say conditions, will cause it to change automatically.

One or the other may gain in volume so slowly that the welder fails to notice it until the harm is done. A proper regulation of the flame is not all—it must be handled according to the job. For cycle cylinders like this one, the flame should always be in motion, swinging in tiny circles or zig-zag arcs across the melting flange with the point of the white cone a certain distance from the metal after it starts to melt. This distance is governed somewhat by the action of the metal; when it is somewhat fluid and is bright, the flame may safely work along at this height above it.

If it flutters and blows about under the pressure of the flame, the welder is more than likely holding the cone too close, probably boring directly into the weld—a

Keeps out and

You now can have real

Filtered Air

NOT A particle of dust—not a bit of dirt—not a drop of oil—in the air that goes into the tire from the No. 7 Filtered Air Outfit. This means a protection for tires—a protection that the motorist will appreciate—that is worth dollars to him. He will come to your place of business for this air service, enabling you to make many sales of your goods and to render "pay" service on his car.

This new No. 7 AU-TO AIR COMPRESSOR is a great business builder. You have something to offer that the motorist wants. You will find it a profitable investment right from the start—bringing you customers from all classes of motorists.

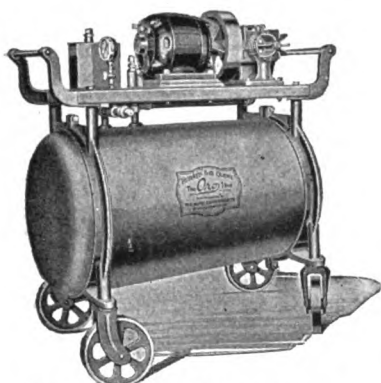
Only 3 Moving Parts

Consider this for simplicity—only 3 moving parts in the compressor mechanism proper. There is nothing to cause trouble, nothing to watch. The outfit is complete in itself. It will maintain a good supply of air day and night. When the pressure goes down the power switches on automatically; when the pressure goes up the power switches off. There is a gauge, an automatic unloader, and a perfect lubrication system that eliminates any possibility of oiling trouble. Only $\frac{1}{2}$ h. p. motor. Sufficient pressure to handle the largest pneumatic truck tires.

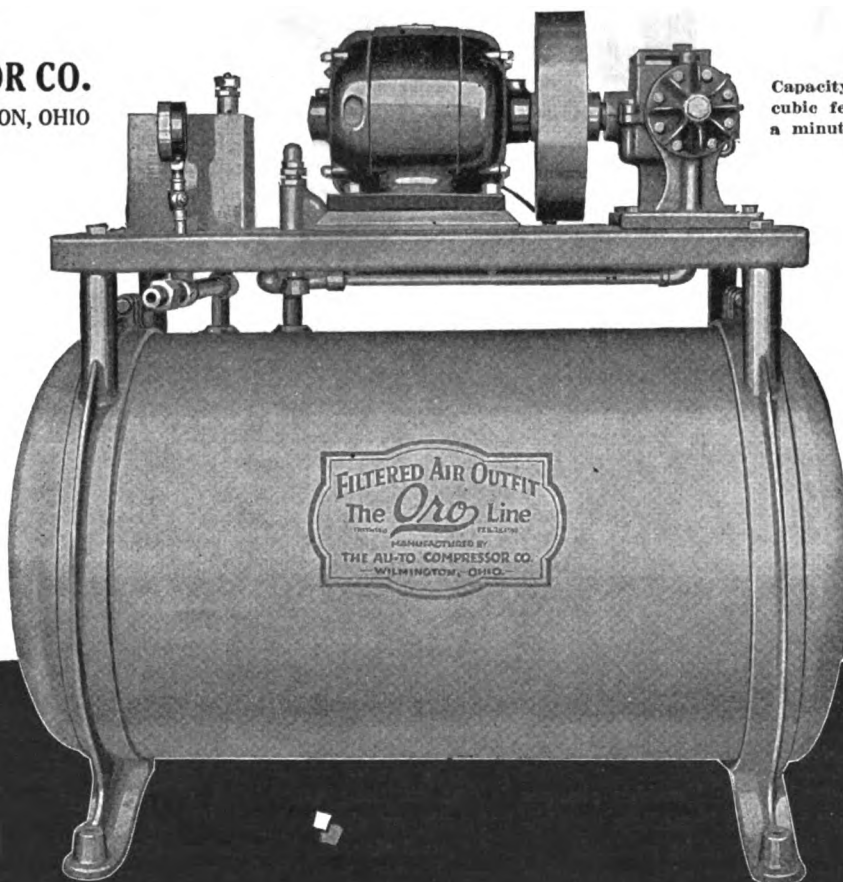
Get the "Filtered Air" Outfit if you want to be up to date. This equipment is making a wonderful hit wherever it is being used. You should be the first in your community to have it. *Ask your jobber, or write us if he doesn't have it, sending his name.*

THE AU-TO COMPRESSOR CO.

304 S. Mulberry Street WILMINGTON, OHIO



Model No. 8 Au-To Air Compressor—same as No. 7, excepting that it has large wheel casters, which make it easy to move from place to place in the shop or garage.



Capacity over 4 cubic feet of air a minute.

a sign like this



brings business.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

course which will cause hard spots if continued. The effects of the flame should be watched continually just as much as the regulating of it.

There is something in the handling of the filler too, besides merely melting it into the weld. Ordinarily it should be kept in motion but should not be allowed to drip into the weld. The melting filler should feed directly into the molten weld. It should be literally pushed in by the churning motion of the rod. Once it has been removed from the weld, it should be heated before being re-inserted.

To make the flux as effective as possible, it should be applied with the heated end of the filler by dipping the rod into a pot of the flux and quickly returning it to the weld. The pot should be placed as near as possible to prevent loss of heat when applying it. This pot should have a wide mouth to help facilitate the dipping of the powder. The welder should apply it to every half-inch of weld unless he is familiar enough with the condition of the melting weld to be able to tell when it doesn't need so much fluxing.

It is obvious then that to make a soft weld on a motorcycle cylinder, we must use the proper equipment and supplies in the right way, trusting nothing to luck.

After the last layer of metal has been added to the flange the opening in the asbestos is closed and the job permitted to stand an hour or more before removing the asbestos. This is to cause the cylinder to cool and contract slowly and forms the best method of causing all parts of the casting to cool in unison. If all the job cools at one time, there will be little danger of contraction acting stronger in one part than another, and resulting in strains or open cracks.

When the cylinder has cooled down enough so that we can no longer feel the radiation of heat when the hand is held near the casting, we may safely uncover the casting and preheater, which was cut off a few minutes after finishing the weld. If there is any doubt about the coolness of the cylinder and an urgent need for the table to weld another job, the cylinder may be quickly swathed in asbestos and set to one side to finish cooling; it should be wrapped snugly enough to exclude the air.

The welded motorcycle cylinder ready to be machined is shown in Fig. 3. The surplus metal will be seen added to the flange. This metal is ground off on the edges and turned off on the bearing surface. The holes are centered and bored, and the cylinder is ready for service.

Timely Cold Weather Precautions. (Concluded from page 36.)

sides. Extreme heat and sudden changes in temperature and the immediate proximity of steam pipes should be avoided.

Do not select that part of a garage that may be damp or musty and is close to stables, as the fumes therefrom are very

injurious to the finish. Nothing deteriorates the finish of a car more than mud, dirt or grease which is left on for a considerable length of time, and hence start preparing the car by giving it a thorough cleaning.

Clean the motor and chassis with kerosene by spraying it on and then wiping off with old rags. If no sprayer is handy, use rags soaked with kerosene. Hot water into which has been added as much washing soda as will dissolve is also very good for this purpose, and perhaps a little cheaper.

After the chassis has been thoroughly cleaned, remove all oil and grease spots from the body with gasoline or Ivory soap and water. Butter, the stronger the better, is very good for removing tar and other spots from the body. Wash the top with lukewarm water and castile soap. Dust the tonneau and rub the leather with a solution of turpentine and linseed oil. Then wash the car in the usual manner. Wipe dry with a chamois and give the body a good polishing.

The next thing to tackle in preparing the car for storage is the engine and its accessories. Drain the water from the radiator and cylinder jackets, and refill with hot water into which has been added as much washing soda as will dissolve, and run the motor for 10 to 15 minutes at a speed of about 20 to 30 miles per hour.

During this time inject with a grease gun or battery syringe about two quarts of warm water through the air-intake of the carburetor. After injecting the water, inject about a pint of kerosene in the same manner. This will help to loosen up the carbon and prevent it from hardening during the winter months.

Drain the water from the radiator, flush out with clean water, and if the car is to be idle throughout the winter, fill the radiator and cylinder jacket with a gallon of alcohol to prevent water accumulating in crevices, freezing and cracking the radiator.

Fill each cylinder with kerosene, at the same time slowly turning over the motor to distribute it throughout the pistons and valves. Drain the oil from the crankcase and refill with fresh oil. Drain the gasoline from the carburetor. Put some vaseline on the rotor button and segments to prevent them from rusting. Take off the fan belt and let it hang loosely on the pulley. Partially depress the clutch pedal and block it in this position so that the clutch remains slightly out of engagement.

Then lubricate all moving parts with light oil and turn down grease cups. All parts that are nickel-plated should be coated with yellow vaseline. Do not use white vaseline, because it contains acid.

The battery can either be removed and kept in the garage and charged every month, or else kept in the machine and removed for charging when the specific gravity falls below 1.24. The storage battery must always be given special attention, for it will gradually discharge and when

in a partially discharged condition will sulphate or freeze. Be sure to add distilled water to the battery whenever necessary to keep the fluid level above the plates. Disconnect the battery to prevent it from discharging through any slight leak in the car wiring, and apply vaseline to the battery terminals and lead connection to prevent them from deteriorating.

Tires are the only other parts requiring special attention. Under no circumstances should they stand the weight of the car when not in use. Jack up the car and deflate the tires to 20 pounds.

It is best to remove the tires, take out the inner tubes, deflate them, clean the casings thoroughly with soap and water, dry them thoroughly, sprinkle with talc or soapstone, wrap in canvas or wrapping paper, and find a suitable place for them where they will not be subject to extreme temperatures and where it is dry and dark.

The wheel rims should be cleaned and painted with a mixture of graphite, alcohol and shellac. Ordinary stove polish is also a good paint to apply to the rims.

The tools should be cleaned and greased to prevent them from rusting.

Finally, cover the car with a dark gingham cloth which has been stitched at the seams and hemmed around the edges to make it last longer and keep it from ripping.

In preparing the tractor for storage, about the same procedure as outlined for the automobile should be followed. In addition, if the tractor has a friction drive transmission, be sure to treat the fiber with Neat's foot oil to prevent it from drying and hardening or even cracking.

The gears should be cleaned thoroughly from all grease and dirt, and then painted with a solution of graphite, alcohol and shellac. This will prevent the gears from rusting.

District Court Decision Opens Way for Curbing Cut-Price Evil.

A decision of importance to manufacturers has been handed down by Judge Westenhaver of the U. S. District Court of Ohio in the case of A. Schrader's Son, Inc., whom the federal grand jury had indicted on the ground of certain contracts made by A. Schrader's Son, Inc., with the tire maker and jobber for the handling of its goods. These contracts fixed the prices at which the tire maker might sell to the jobber, retailer and consumer and the prices at which the jobber might sell to the retailer and consumer.

The decision of the court was in effect that the charges in the Schrader indictment did not constitute a crime under the Sherman anti-trust act, and the indictment was accordingly dismissed. It is apparent under this decision that if the Schrader licensees do not observe the prices fixed, the corporation would be well within its rights to refuse to sell them any further products.

Going STRONG—Everywhere

MUTUAL America's Greatest TRUCK

Backed by America's Greatest "Business-Paper" Campaign

FROM coast to coast, and from Canada to the Gulf, inquiries that *mean business* are coming in from truck buyers and fleet owners.

The men who sign them are the Captains of Trade and Industry and their high-salaried executives.

Out of Their "Business Bibles"

For they are reading our big double-spreads in their "business bibles"—the trade, technical and class papers of their business callings.

A Million Executives

read these striking ads—now running in 65 Business papers—read them in their *buying moments* as a business duty—and *respond* because they are the sort of men who want the *best* and have the money with which to *buy* the best. The inquiries that we are turning over to our dealers, are therefore assets, rather than curiosity-seeking liabilities. ("Kids" and penniless catalog collectors don't read Business papers.)

Our Local Newspaper Campaign

for you, over your signature, in your own local newspaper will *clinch* this powerful direct-appeal and will open doors to you that are closed to most truck dealers.

The Mutual IS—"America's Greatest Truck"

You will *know* that our claim is true the moment you see this most perfect of all motor trucks; and the more you know about truck engineering and truck construction the more quickly and fully you will realize that the little city of Sullivan has given birth to a truck that will outsell any other heavy duty commercial vehicle ever built.

It is not only bigger and stronger all over than the most famous and highest priced trucks on the market; but it contains, in one machine, ALL the refinements that are found on all the rest put together; as well as some special features found on no other truck.

It is a truck that will make you the *dominant* truck agent of your territory. A wonderfully easy truck to *sell*; and a mighty hard one to sell *against*.

Better Get In Line!

But don't waste your time or ours if you are not big enough to contract for at least ten trucks for each county you undertake to handle; nor unless you are progressive enough to "go 50-50" with us on the local newspaper campaign over your signature.

Write, wire, phone—or better still, COME TO SULLIVAN.

MUTUAL TRUCK COMPANY, SULLIVAN, INDIANA, U. S. A.

Tentative Chart of Accounts Set Up

An Analysis of the Accounts Outlined in the "Revenue and Expense Divisions" of the Tentative Chart of Accounts Set Up for Automotive Dealers—
Criticisms or Suggestions from Readers as to Variations Are Welcomed

By J. Newton Boddy

Manager, System Department, Tanner, Gilman & Ellis, Chicago

For the sake of simplifying our analysis of the revenue and expense divisions, we will now regroup the remaining accounts of the tentative chart which appeared in the August issue.

Revenues—

- Sales.
- Cost of sales.
- Sundry income.
- Sundry deductions.

Expenses—

- General expense.
- Sales expense.
- Service expense.
- Other Additions and Deductions—
 - Interest earned.
 - Discount earned.
 - Interest allowed.
 - Discount allowed.

Sales.—This account represents the total sales of all items, including labor the garageman or auto dealer sells. This account is, in other words, the control for sales—new cars, used cars, trucks, used trucks, trailers, tractors, tops, bodies, parts, supplies and accessories, tires and tubes, gasoline, oil and grease, alcohol, livery storage, repairs, vulcanizing, batteries, charging batteries, wash and polish, upholstering and scrap. While it is true that no garageman or auto dealer will have all these departments in his business, still every department should be carried separately. Nearly all automotive dealers should subdivide their sales into at least eight departments.

Since sales account represents the total sales of all items or departments of the business, it follows that we must keep a department sales ledger to record detail of sales.

Credit with amount of sales as shown by the sales ticket or invoice.

Debit with cost of sales of each sales ticket or invoice.

Balance will represent the gross profit on sales.

In this connection, it may be well to remind you that prepaid charges, postage, insurance freight, or express, must not be included in your sales, but should be shown as a credit to their respective accounts. War taxes

and carrying charges also should not be included in the sales account.

The remarks on sales' control apply equally to each of the subsidiary or department accounts of the sales.

Cost of Sales.—This account represents the total of the costs of each item shown on the sales tickets or invoices. Where the item is merchandise, the cost is the purchase invoice price with delivery or transportation charges added. Where the item is a service or labor department item, the cost represents cost of labor used with

To fail to take your discounts is poor business policy. Every discount increases your profits just so much. Use some business promotion scheme to encourage your own customers to prompt payment. Ready money gives to every business man a distinct advantage.

cost of supplies or material used added.

Since Cost of Sales is a clearing account, debits and credits are the same; namely, cost of items shown on the sales ticket or invoice.

Cost of Sales is debited and merchandise credited; Cost of Sales is credited and sales debited. This clears Cost of Sales and leaves sales debited with Cost of Sales and merchandise credited by Cost of Sales. Cost of Sales may, therefore, be carried as a memo account only.

Where Cost of Sales includes labor, the routine is the same except the accounts affected are different. Sales and Expense instead of Sales and Merchandise.

Sundry Income.—This account represents income received from non-operating sources such as rent, sale of power, sales of fixed assets, furniture and fixtures, equipment, etc., from commissions on insurance, or from commissions on outside sales.

Sundry Deductions.—This account represents losses sustained from non-

operating sources, from sales of fixed assets.

All sundry additions to and deductions from revenue should be shown in detail on the ledger; that is, an account should be set up to represent each source.

General Expense.—General Expense is supposed to include all expenses that apply to the business in general rather than to the sales or shop departments. It happens often, however, that certain items of expense cannot be properly or conveniently distributed at the time of record and so are carried in the General Expense until the end of stated periods when the distributable items are posted to their respective accounts.

Personally, I believe that, in the great majority of cases, expense can be posted direct to Sales or Shop Expense. The fewer items carried in General Expense, the more accurate the accounting.

In General Expense may be included the following: Officers' and office salaries, porters' salary, watchman's salary, office supplies, depreciation on office equipment, rent, depreciation on buildings, heat, light, power, water, telephone and telegraph, insurance on buildings, insurance for employer's liability, printing and stationery, law and audit, repairs and improvements, revenue stamps, postage, towel supply, advertising, entertainment, association fees and dues, trade journals, exchange, car fare, employment and welfare, taxes, and sundry general expense. This last account is to take care of miscellaneous small items not included in any of the foregoing.

Debit with amount of expenses as they accrue.

Credit with amount of rebates and allowances on expense invoices, with amounts distributed to Sales and Service Expense accounts.

The balance will show the net general expense chargeable to profit and loss. This should represent finally only a portion of officers' salaries as



**Would not sell his
Marvel for 10 times
the price—writes
one Marvel owner**

Here is proof—from
your side of the fence
—from an owner of a
shop like yours.

Read his letter and
then put yourself in
his place.

Marvel Cylinder Re-Boring Machine No. 5

is a real business builder and money maker. Think it over—would not sell for ten times the price—and he used to pass up that work just because his shop wasn't equipped to handle it. When a hard-headed, shrewd business man writes us like the above it stands to reason that he is well satisfied with his MARVEL. He's making money with it, he is building a real business with it—it put him on the map and will keep him there. Hundreds of other garage and repair men are doing the same. And so can you.

Get Your Share of Marvel Profits

Install a MARVEL No. 5 in your shop, and reach out for this money making business. Give your customers MARVEL service. They will appreciate it. Gives you a better class of work than you ever had before, you do the work in less time and it pays you a bigger profit.

What the Marvel Will Do

The Marvel No. 5 is power driven, automatic, efficient, easily operated. It is accurate and will handle any gas engine cylinder from a motorcycle to a tractor. The MARVEL No. 5 will pay for itself in a short time and will build you a profitable business.



Write for our PROPOSITION

Do it today, NOW, before it slips your mind. We have a proposition so good, so profitable that you can not afford to pass it up. Get our literature and see for yourself how it is done.
Drop a line, even a postal will do.



MARVEL MACHINERY COMPANY

510 Loan and Trust Building

MINNEAPOLIS, MINN.

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

I believe all other expenses should be distributed to Sales and Service Expense accounts.

Sales Expense.—This account should include all expenses directly incurred for or by the sales department. This being the case, there is hardly an item in general expense that does not directly affect the sales expense.

To the accounts enumerated in general expense must be added the purely sales expense accounts, salesmen's salaries, commissions, salesmen's expenses, demonstrating expense, free repairs on cars, free service on cars, depreciation on used cars, depreciation on demonstrations, depreciation on salesroom equipment, insurance on cars, insurance on salesroom equipment, bonds for salesmen, rebates and allowances, bad debts.

When any item of expense shown in the general expense chart is chargeable to sales expense alone, charge it directly to this account and not through the general expense account.

Debit with undivided sales expenses as they accrue, with sales portion of service expense, and sales portion of general expense.

Credit with amount of rebates or allowances on sales expense invoices.

The balance represents net sales expense chargeable to profit and loss.

Service Expense.—This control account includes expenses incidental to all departments where labor or service is involved instead of merchandise—repairs, vulcanizing, batteries, charging batteries, upholstering, livery, storage, wash and polish.

These accounts include wages, outside labor, supplies, materials, rent, heat, light, power, insurance on shop equipment, insurance for employers' liability, taxes, depreciation on equipment, depreciation on shop, etc., and the service portion of general expense.

The most serious and most prevalent fault with most garagemen operating a service department is that in figuring profit and loss on the departments of their business, they fail to include many items of expense properly chargeable against this department. Though their books may accurately show the results of operations of the business as a whole, they fail utterly to show the profit and loss by departments. Consequently many men are playing the losers and neglecting the winners.

Debit with the amount of expense

as it accrues, with the amount distributed from general expense.

Credit with the amount chargeable to Cost of Sales or work in process, with amount of rebates or allowances on service expense invoices, with amount chargeable to Sales Expense.

The balance will show net service expense chargeable to profit and loss.

Other Additions and Deductions.

—Interest earned, discount earned, interest allowed and discount allowed should, for good accounting and income tax purposes, be shown as separate items, not shown combined as interest earned and allowed giving net results.

These accounts are, however, sometimes combined as Interest and Discount Earned, and Interest and Discount Allowed. Under this division would also be included interests, discounts and premiums on stocks, bonds, and other securities.

In our next article we will discuss the form and method of recording the daily business transactions. A graphic illustration will be given of a standard "Cash-Journal and Bank Register" and its application to the business of the average garageman and auto dealer, outlined.

Taking an Inventory of Your Stock.

(Concluded from page 17.)

hours so that there will be no changes in the inventory during the count.

Your inventory is now complete as to quantity and can be priced and extended at your convenience. When your stubs have all been properly priced and extended and the prices and extensions checked, they are re-assembled into departments and posted to inventory sheets, such as shown in the illustration and which can be procured from the local stationers. These should be filed to make a permanent inventory record, which is of great value in taking later inventories and for insurance purposes.

Finally, be sure the sum of the extensions on the stubs and the total on your permanent inventory sheet agree. The only way an accurate inventory can be speedily taken is to plan a system of taking it and stick to the plan. Haphazard, hit-or-miss inventories mean nothing and are oftentimes very misleading. For taking inventory the writer suggests the following departments the inventory should cover:

1. Cars, trucks, trailers, tractors, farm electric plants. 2. Service cars.

3. Shop equipment. 4. Tools. 5. Shop supplies. 6. Parts. 7. Tires and tubes. 8. Supplies and accessories. 9. Furniture and fixtures. 10. Office supplies. 11. Gasoline. 12. Oil and grease. 13. Jobs in process. 14. Used parts and scrap. 15. Miscellaneous.

This is not complete and special departments, such as batteries, radiators, tops and bodies, vulcanizing, etc., must not be overlooked.

Your inventory of furniture and fixtures, shop equipment, etc., should agree with the ledger accounts, the only possible adjustment being on account of discarded or scrapped items that were not properly so recorded on the books. It is not necessary even to price the tag stubs, as the amounts for the inventory sheets can be posted from the ledger account.

In conclusion, let us suggest that the taking of an annual or semi-annual inventory can be avoided and should be unnecessary. Any garageman or auto dealer, whether his business is large or small, can carry a perpetual inventory and so be in a position to make an accurate financial statement on short notice. There is a choice of so many ways of carrying a perpetual inventory that it is a pity any stock should be poorly balanced. In a later issue we will devote an article to stock records as they apply to the garageman and auto dealer.

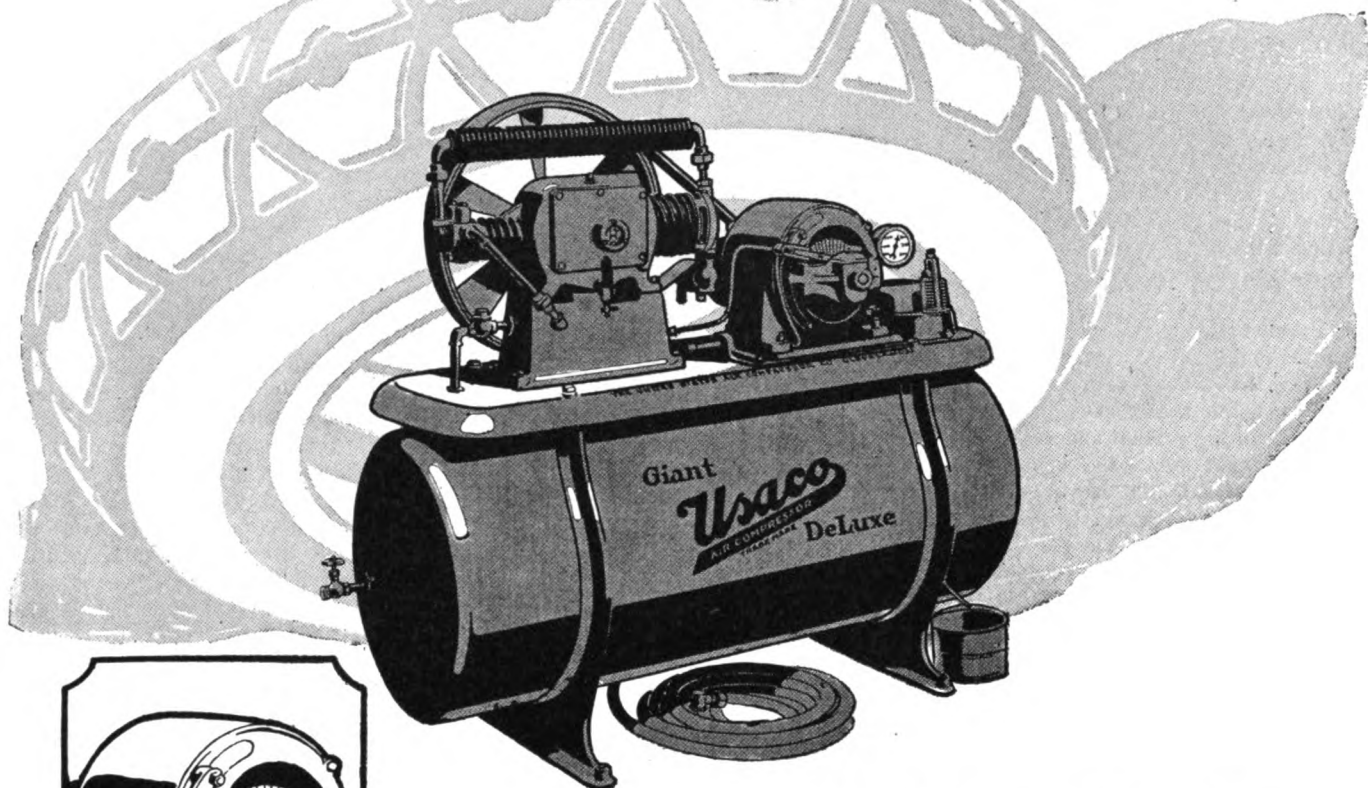
Chile Adopts Motor Trucks for Mine and Farm Work.

Recent experiments have been made with motor trucks in the nitrate district of Chile. Here, up to the present time, oxcarts and mule teams have been in use. If the success of the truck is demonstrated, however, it will undoubtedly replace these slower means of transportation.

Autofagasta, in northern Chile, is already one of the best automobile markets in the country. Even the taxicabs are large, expensive models. A law requires that freight vehicles be equipped with springs, hence the old-time heavy carts are not used on city pavements.

The first motor truck was introduced in 1916 and an autobus line was started the same year. Lately, automobile garbage trucks have been installed in the city, and motor trucks will probably be used eventually by all of the mining companies for transporting supplies to camp.

Two Stage *Usaco* Air Compressors



THE USACO PATENTED UNLOADER

Avoid Burned Out Motors, Blowing of Fuses, Etc.

When the desired tank pressure is attained the motor is automatically stopped and air exhausted from the auxiliary tank.

In pumping again, the motor starts without load and gradually picks it up as the pressure raises. It is positive and fool-proof as the release stays in the "open" position until the motor attains normal speed, preventing overloading—the common cause of motor trouble.

The
Usaco
AIR COMPRESSORS
TRADE MARK
LINE

contains both two-stage and single stage compressors, suitable for any garage air service that exists.

A Greater Unit for a New Era Adapted for Pleasure Car or Truck Tires

Just as the Standard De Luxe Compressor anticipated the demands of a few years ago, this new Giant Usaco comes forward girt with ability to meet the more severe requirements of a new era.

Giant Truck tires, now extensively used and being adopted on an ever ascending scale, require service greater than that for which the average compressor is capable. The ever growing use of automobiles confront free air plants with unprecedented demands for service.

Many successful compressors of a few years ago can no longer be seriously considered. Good judgment now demands equipment, not only suited to the present high demands, but with surplus capacity and enduring qualities equal to the greater demand sure to come.

The Giant is just such a machine. With larger compressing and storage capacity than ever before available, it is the most capable, most refined, most highly automatic, most enduring and most nearly fool-proof air unit ever perfected.

The United States Air Compressor Co.

6542 Carnegie Ave. *Cleveland, Ohio*

How to Make the Shop Profitable

Customers Claim They Can Have Work Done and Buy Accessories Cheaper in Chicago—Bill's Curiosity Aroused—Investigation Tour Reveals that System and Service Are the Keynotes of Large Distributing and Service Stations

By E. B. Hinrichsen

After breakfast the next morning, they strolled around the hotel grounds and smoked, and looked at the lake and discussed their plans for the day. They decided they would investigate along the same lines as the day before, but would, if possible, gain access to some of the service stations maintained by the larger car dealers.

They went back to their rooms, got their grips, and came down to the office to pay their bill, first ordering their car by telephone. Bill nearly had a fit when Mr. Brown paid the account and demanded details as to what they were paying for. He got them and found that they were charged \$1.50 for car storage, which included the driver to and from the hotel.

Mr. Brown did not dare to let him see what tipping he did for fear Bill would try to wreck the place. As it was, Bill grumbled steadily until they reached Lincoln Park, the beauty of which soon put him in a good humor.

"Their charges were not really too high, Bill," remarked Mr. Brown, when he saw that Bill was in a better mental state, "when you consider the service we received and what service was at our disposal if we cared to use it. Without any particular effort on our part, we were taken care of in every respect. The only things we expected to do were to order our food and to pay our bills. Such service is of as high a class as you render your customer and is really worth what you pay.

"In a hotel of that kind, the patrons are glad to pay for not having to exert themselves, or to worry over domestic arrangements. It is largely used by big business men who cannot afford to go through their tremendous daily mental strain and then come home and be bothered by a long string of household troubles. Your wife takes care of all that for you, but you don't realize it. Think it over for an hour or so, and I think you will get a different viewpoint."

Bill did not reply, but kept on his way down through the park, around the winding drives, past the beautiful boat harbor with its collection of power boats lying in their slips, and then out on Lake Shore Drive.

South on the Drive, with the impressive residences on the right and the blue water of the lake on the left, with every tree and blade of grass on both sides in perfect order, Bill had to forget his grouch. He got it back again, however, when they went through the loop.

What particularly aggravated him was the way certain conspicuously painted taxicabs dodged around and cut in and out. He grumbled and swore they would get bumped, but suddenly became thoughtful and, when Michigan avenue was reached, pulled up to the curb and sat watching them for some time. "They are wonders," he commented at last. "At first I thought they were just reckless, but now I believe they are the best drivers in the world. I wonder how they teach them."

"Perhaps we can find out before we go home," said Mr. Brown. "We will make an effort to, anyway."

Their first call was made at the headquarters of the agency for one of the higher-priced cars. Mr. Brown was acquainted with the manager, who took them through the building, introduced them to all of the department heads, and told them to investigate all they cared to.

They spent a little time in the display and salesrooms, and were much impressed with the way the salesmen handled the customers. There was no hurry and, as far as they could see, no effort was made to force a sale. The salesmen seemed to be there merely to entertain people; but one could readily see how the system worked. A prospective buyer was made to feel entirely at home and, subconsciously, that his purchase was a matter of course as soon as he was shown the merits of the goods.

They next watched the parts department work. There was a window for the shop and one for the public. The business at the public window was light, but that at the shop window was very heavy. Everything seemed to work well here. It was a little slow, but the window men were courteous and gave the customers every assistance in their power.

Bill was particularly impressed by the way the shop trade was handled. The "runners" were treated exactly as the public. They were apparently old and valuable customers and received instant attention. Everything was business and the atmosphere of the department made a decidedly good impression. Bill picked up a number of points.

They now went into the shop. They found that it was run on very much the same plan as their own. The method of receiving and testing the jobs was similar, but after the work was in the shop the entire job was usually done by one crew instead of the different parts being han-

dled by different gangs. Bill decided that his method worked better. He also figured that the work could be speeded up to a greater extent.

The service manager, who was showing them around, stated that he was satisfied with the speed. He said that their work was all on one make of car and of such a nature that care was more to be desired than rapidity. Due to the fact that their work was on pleasure cars only, a few hours extra was of no great consequence.

The visitors were surprised to find that very few jobs were paid for on delivery. It was explained that the class of customers they had was composed of substantial men who made a practice of paying their bills every 30 or 60 days and that bad accounts were practically unknown.

They explored the whole place from cellar to roof, finding much to commend and but little to condemn. The principal fault was that the greatest possible production was not being obtained from the forces and equipment employed. They decided that their next call would be at an agency which handled a lower-priced car.

(To be continued.)

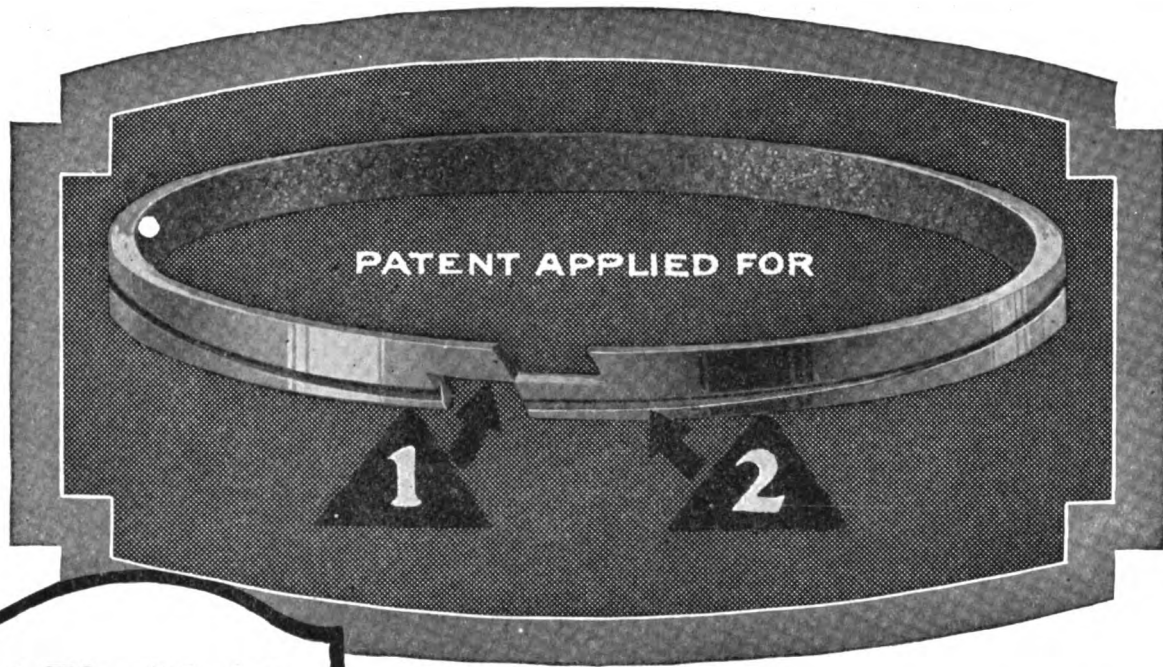
Millions to Be Spent for Good Roads in 1919.

Estimates of contemplated highway expenditures in the United States for the season of 1919 place the total at approximately \$300,000,000. Because of governmental restrictions the amount was considerably lower than this in 1918 while 1917 it was placed at \$280,000,000.

New Pennsylvania Law Expected to Lessen Motor Thefts.

Pennsylvania's new automobile bill, which went into effect July 1, requires all persons selling used or second-hand cars to fill out a form under oath and pay \$2.50 on each transfer of a car. In other words, the person who sells a car of this kind must furnish the purchaser with a statement and description of that car under oath. The purchaser sends the original to the state highway department with the \$2.50 fee.

The seller gives the purchaser a similar statement in duplicate under oath. The purchaser then files an affidavit with the state. The chief object of this tax on the sale of used cars is to make it difficult to dispose of stolen cars in the state.



- 1 The Lightning Cut**
2 Oil Distributing Groove

RIGHT: Shows shape of oil groove. Note scraping edge.

BOTTOM: Shows upward course of oil groove.



Lightning Cut Locks Itself Against Compression Leaks

WHEN expansion forces the horizontal cut, the edges of the diagonal cut maintain a sliding contact on the opposite wall. It locks against compression leaks. That's why the Lightning Cut combines the old diagonal and step cuts.

tion, offer only a single unit for the flow of heat during expansion. Their strength prevents breakage. Their simplicity makes for easy installation. You're safe when you sell Lightning Cut Rings. Safe when you promise your trade more power and more mileage, with less fuel, less oil, less friction, less wear and fewer repairs.

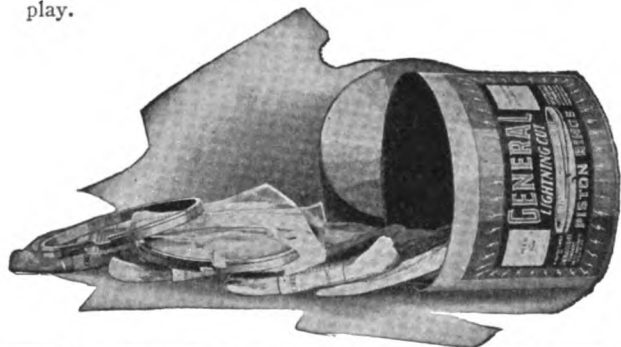
GENERAL LIGHTNING CUT PISTON RINGS

Jobbers

You're safe, too, on profits. We are revolutionizing the marketing of piston rings. Our selling plan is of vital interest to you. If you don't send in an initial order today at least write or wire for details. Made in all sizes. Packed in oil proof envelopes. Neatly boxed, one dozen to the carton. Cartons are attractively labelled and make a handsome display.

The natural friction between piston ring and cylinder wall is minimized. The Lightning Cut oil groove, extending in an upward sweep around the ring carries oil to where it does the most good. The straight edge of this notched groove effectually scrapes away all excess oil. It goes back to the crank case for further duty. Lightning Cut Rings are individually cast. All sides cool immediately. Their fine texture, evenness of tensile strength, and "springy" tension are not duplicated in rings sliced from pot castings. The scale left on the inside gives extra "springiness." There is no wear on cylinder walls due to unequal ring pressure for Lightning Cut Rings are of full concentric design. And since no material is cut away there are no spaces for oil to accumulate and carbonize.

Lightning Cut Rings, because of one piece construc-



UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

Factory 1324 Ogden St. Philadelphia - Office 809 New Stock Exchange Bldg., Philadelphia

Utilities that Sell Because They Serve

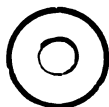
Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Facts and Ideas for the Tire Dealer

You Have Heard of Hog-Tying— Ever Try Rim-Tying?

Did you ever walk down a street and notice how many of the cars that were parked along the curb had an extra rim on the side or rear that was minus a tire?

Well, C. H. Wooden, of The Lamar



**We Have
The TIRE
To Fit
This RIM**

**The Lamar Motor Sales Co.
RIGHT ON MAIN STREET
LAMAR, COLO.**

**We put it on
You wear it off**

Tag Used for Rim-tying Cars.

Motor Sales Co., right on Main St., out in Lamar, Colo., took notice of that very thing. Out of the 117 cars that were parked, 26 were minus the extra tire so he had tags made with printed matter on both sides and they certainly worked wonders.

As Wooden says: "You, Mr. Garageman, have heard of hog-tying. Well, try rim-tying and see if you don't increase your tire sales."

A good time to do this is in the evening when every one is downtown and the cars are parked. You can get one of the boys to tag them after work hours at very little expense.

Makers of Pneumatic Cord Tires State Advantages of Products.

Never in the history of the motor truck industry has any proposition presented it-

self which has greater possibilities than do pneumatic cord truck tires, is the assertion of the makers of these products. All the advantages of pneumatic tires for trucks center around two fundamental qualities—cushioning and traction.

Compressed air enclosed in cord tire construction provides even truck action and smooth travel over heavier rolling, rugged and stony roads; reduces truck repairs, depreciation and load damage.

Owners' records of city and intercity service and farm service indicate considerable saving in repairs, in hauling time and in loads by the employment of pneumatic cord tires. Some of these records show that no repairs were necessary in eight months' time, and that the upkeep was reduced from 50 to 75 per cent. Others bring out the fact that little or no crating is necessary, and damages next to nothing.

In farm service, it was stated that there was a reduced shrinkage in cattle shipments, a big saving in the shipment of delicate plants and florists' products, berries, and other perishables.

The average breakage with pneumatic cord tires on trucks, the manufacturers claim, is 4 per cent, as against 15 per cent by trucks equipped with solid tires and 11 per cent by freight or express.

Careful observations by highway engineers have shown that solid-tired trucks tend to increase the cost of highway upkeep. The vibration of solid-tired trucks also produces greater strain on bridges, culverts, etc.

Engineers of highway construction expect that the effect of truck tires on road surfaces will develop into an important factor in determining the type of tires on most trucks used on our highways.

Pneumatic cord tires are said to have no more effect on highway upkeep than the lightest passenger tires. The minimum of speed of trucks is increased and the daily radius of operation is enlarged by the ability of trucks to maintain their rate of speed.

That the broad wearing surface and the non-skid features enable a truck to make uninterrupted travel through sand, snow, mud and ice, and that the high resiliency and easy-rolling qualities tend to reduce fuel and oil consumption over bad and good roads, are the further claims of the makers.

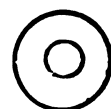
The records of owners having pneumatic-tired trucks in city and interurban service show a decreased gasoline consumption of from 20 to 30 per cent and a tire mileage of from 14,000 to 20,000 miles. In farm service, records show a

mileage of 12 to 18 miles per gallon and tire mileages from 14,000 to 30,000.

Every motor truck gives successful operation today if provided with more power than it could use for more than 10 per cent of the time. In other words, from 30 to 75 per cent of the power-developing ability of the engine is not used 90 per cent of the time during which the truck is in operation. This excess power, which is needed for a start up a steep hill or pulling through deep sand, mud and snow, should be turned into profit-producing energy. The use of pneumatic cord tires will tend to increase the efficiency of the truck.

Gates Rubber Co. Increases Mileage Guarantee on Tires.

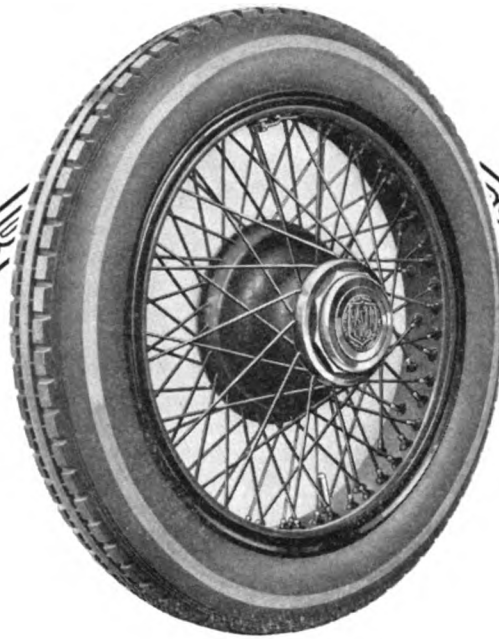
Announcement has just been made by the Gates Rubber Co. that it has increased the guarantee from 3,500 to 5,000 miles on its Gates half-sole tires. This new mileage adjustment guarantee followed an analysis of the records of over 1,000 Gates half-sole tires now in use. These records show the average mileage to be between 5,000 and 7,000 miles. Some tires have given as high as 20,000 miles of service.



**We have a
TIRE
for Every Purpose
at a
PRICE
for every
PURSE**

**The Lamar Motor Sales Co.
RIGHT ON MAIN STREET
LAMAR, COLO.**

A Business Producing Tag.



QUALITY FIRST In PASCO WIRE WHEELS

Inborn quality—the ingenious safety-lock, the distinctive method of spoke-lacing, the indestructible hub cap, the complete curb-clearance, the maintaining of the standard wood wheel tread—this inborn quality is the standard to which PASCO WIRE WHEELS are built. And with large and efficient production—no royalties to pay to outside patent holders—we are able to offer this quality product at a minimum price.

NATIONAL WIRE WHEEL WORKS, *Inc.*

General Sales Offices: DETROIT, MICHIGAN

Factory: HAGERSTOWN, MD.

Canadian Distributors: NORTHERN ELECTRIC COMPANY, *Ltd.*, MONTREAL

From the Truck and Trailer Field

Service Motor Truck Co. Moves Into New Office.

The offices of the Service Motor Truck Co., of Wabash, Ind., have just been moved from the building which they have occupied for the last ten years into a new brick and reinforced concrete administration building which was recently completed.

During the last few years the efforts of the Service organization have been spent in enlarging the factory and facilities for production. It was able to turn out a vast number of Liberty "B" military trucks during the war and is now producing a large number of trucks for commercial purposes.

In addition to the offices, the administration building contains recreation rooms, offices for visiting distributors and dealers, and a huge auditorium where sales conventions can be held.

Lubricating Oil Is Said to Be Life of Motor Truck.

Too much attention cannot be given to the matter of lubrication if the best results are to be obtained from a motor truck.

It does not require a great deal of work

found by distributing a load over the many wheels a truck could transport a much larger tonnage over soft ground than would be possible if it were all loaded on the truck with only four wheels to take the pressure.

Use of Trailer Reduces Delivery Costs and Labor.

An important item entering into the cost of doing a retail merchandising business is that of delivering purchases. It is proportionately larger in the smaller communities than in the larger cities, because customers are more widely separated and because the items of rent, wages, taxes, etc., are relatively higher in the cities.

Whatever reduces the cost of doing business increases the merchant's profit, or enables him to reduce his prices and increase his trade. In the city, the cost of delivery averages five cents or more per package, even with the best motor wagon system. It is sure to be more in small towns and rural communities, especially where the work is done with horses and wagons.

The advantages and economy of using motor vehicles for delivery work have been pointed out repeatedly, but there has

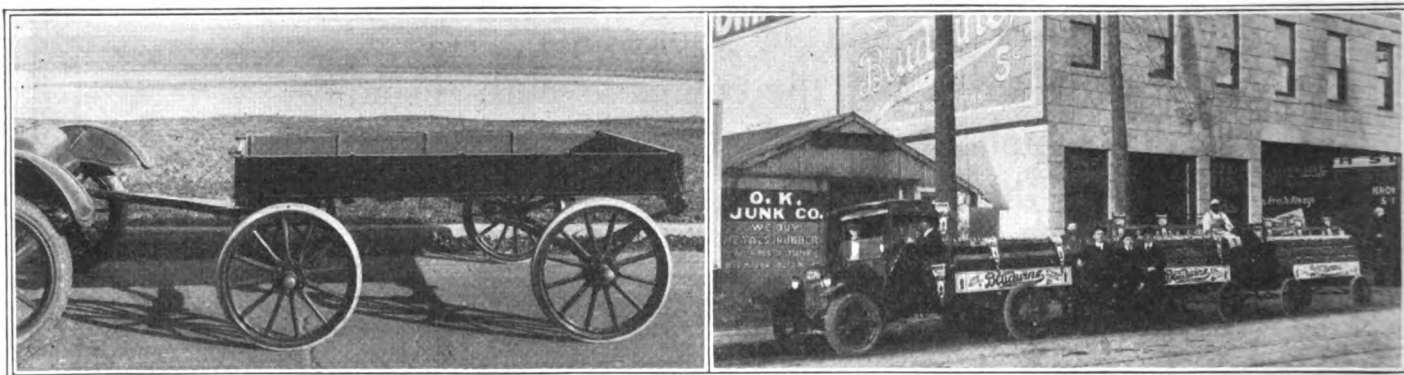
he can make it do double duty by substituting a trailer for the horse and wagon used in his business. When deliveries are to be made from his store, the packages can be loaded into the trailer and the trailer attached to the automobile and drawn over the delivery route in very quick time.

While the orders are being put up and loaded in the trailer, the automobile may be used for any other purpose, so no time is lost. The trailer can be hauled behind the car at 15 to 20 miles an hour, covering a long route in a fraction of the time required by a horse. The radius of delivery may also be extended to points ten or more miles distant from the store.

By using two trailers with one automobile, one of the trailers can be left at the store to be loaded while the car is on the road with the other trailer making deliveries.

Light trailers are made in both two-wheeled and four-wheeled types, and in carrying capacities from 1,000 pounds to one and one-half tons or more. Some are fitted with pneumatic tires and others with solid rubber tires. Wheels are of the automobile type, fitted with ball bearings.

The four-wheeled trailers of one-ton



Light Rubber-Tired Four-Wheel Trailer for Use Behind Automobile.—Two One-ton Trailmobiles Used Behind One-ton Truck.

to properly oil a truck, but such work as is required is very important. The truck will wear longer, and at the same time will give better service while it is working at an appreciably lower cost, if the oiling of the moving parts is properly looked after.

Truck Train With Trailers Chases Villa Across Mexico.

Over the trackless wastes of the Mexican desert a truck train with trailers of the United States Army chased the bandit Villa.

The trailers got through everywhere that trucks alone could go, and the army

came to the front in the last few years a means of still further reducing the cost of delivering goods. This is the trailer, which is in extensive use by large manufacturers, wholesalers, lumber and building materials' dealers, and others, but has not as yet been widely adopted by storekeepers in small towns.

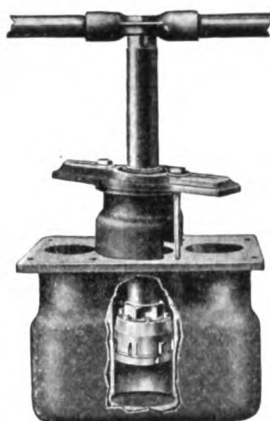
The light, high-speed trailer for use with automobile runabout and touring cars offers a solution of his delivery problem to the small merchant who feels that the volume of his business does not warrant the purchase of a motor delivery wagon and who, therefore, sticks to the method of delivery by horse and wagon.

If the proprietor owns an automobile,

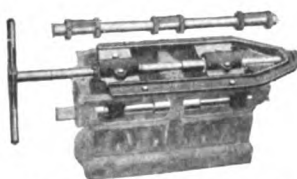
capacity or more have pressed steel frames. Semi-elliptic automobile springs are used in both types, and both are attached to the rear end of the passenger car by a steel drawbar about four or five feet in length. In the four-wheeled trailers this bar is connected with the steering mechanism of the front wheels so that the trailer wheels track with the rear wheels of the automobile. The two-wheeled trailers are provided with a support for the front end that can be raised and held in position when the trailer is running on the road.

Several references have been made to the semi-trailer. This has two rear wheels and the front end is carried on the rear of a motor car, truck or tractor, where

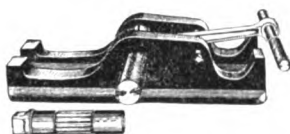
Reap a Good Winter Harvest with



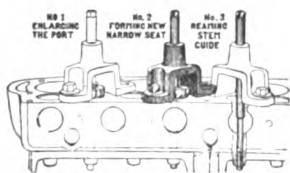
Cylinder Reboring Machine



Main Bearing Babbitting and Boring Tool



STORM Connecting Rod Bearing Reamer, Jig and Gauge



STORM Valve Port Renewing Outfit

YOUR Business Harvest

really depends on your personal efforts. If you are not equipped to do all the repair work your customers bring you, you will reap only a LEAN HARVEST.

Just as it takes **Rain and Snow Storms** to insure good crops, just so it takes **STORM tools** to turn out the **best of work**.

To do the good work you must have tools that are especially designed to handle the particular jobs you get.

Storm Tools are standard equipment in garages everywhere.

STORM TOOLS include:

Cylinder Reboring Machines

Piston Vises

Burning-in Stands

Valve Port Renewers

Main Bearing Babbitting and Boring Tools

Connecting Rod Bearing Reamer and Straightening Gauges

Garages that use the STORM tools find their shops cramped with business, thus proving that **Storm tool users always reap a good business harvest**.

There is a STORM product to supply your needs.

Descriptive literature on request. Ask for Bulletin E-42.

STORM MFG CO.

406 6th Ave., So.

Minneapolis, Minn.

it is supported on a fifth-wheel device that allows the towing vehicle to turn under it and the six wheels of the outfit to rise and fall independently, due to unevenness of the road surface.

The operating costs with trailers and semi-trailers vary with types and sizes used and with operating conditions. One

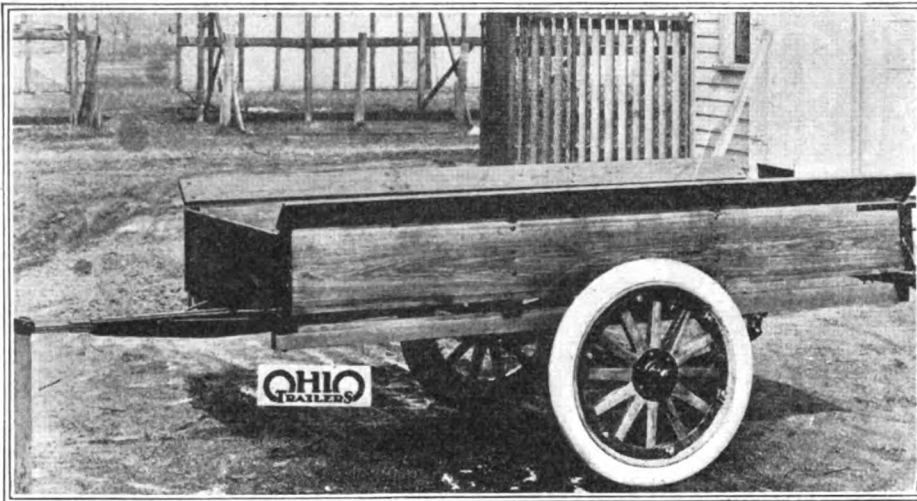
ation of trucks upon prearranged schedule.

Many trucks are driven into the city loaded with farm produce. This load is discharged. The driver fills the few commissions which the truck owner has given him before leaving, and begins his return trip with his expensive transportation unit

bearings, steering gear parts, etc., in trucks that had seen three or four years of service on the granite-paved French roads during the war. All makes of trucks showed them, giving evidence that it was not poor material or construction, but a crystallization of the metal, due to the road vibration that the solid tires could not absorb.

"It appears," said the distributor, "that pneumatic-tired trucks, of which there were a very few in service in the air division, did not show these breakages. One French maker accordingly conducted tests lasting five months with two trucks of identical make in the same class of service. At the end of that time, the solid-tired truck was disabled through a broken rear wheel and the steering pivots were badly worn. On the other hand, the pneumatic-tired truck had covered almost 50 per cent more mileage, due to the fact that it was enabled to maintain higher speed and because it made fewer visits to the repair shop.

"On several occasions the solid-tired truck lost some of its cargo, owing to road vibration and shock, while this never occurred with the pneumatic-tired truck. Several times the pneumatic-tired truck was forced to tow the other up hills on a greasy road surface.



Detachable Rubber-Tired Semi-Trailer Which Can Be Used Behind Automobile.

firm which uses a one-ton semi-trailer with a light touring car for all of its delivery work states that the cost of transportation is about the same as with a one-ton motor truck, but that the car can be used for business purposes or pleasure when not in use with the trailer.

A carefully kept cost record will show the small-town merchant whether or not money can be saved by employing improved delivery methods. Even this saving leaves out of consideration the increased trade obtainable by extending the delivery radius and the advantages and savings resulting from securing stocks of goods by highway instead of by rail.

Motor Vehicle License Revenues Available for Road Work.

Total gross motor vehicle registration and license revenues for 1917 were \$37,501,237.01. Of this sum, \$23,235,897.82 was available for road work by or under the several State departments, \$11,452,705.93 under the direction of local authorities and the remainder was diverted in other departments of government.

Three Influences Work to Further Transportation Efficiency.

An analysis of the future of the motor truck, recently completed under the auspices of the Clyde Cars Co., shows that there are three big influences at work which will tend to further the rapid growth of motor truck transportation.

These are, first, the inauguration of return-loads bureaus in all of the large centers of population. Second, the store-door delivery system; and third, the oper-

absolutely empty. The return-load bureau prevents this waste.

By means of store-door deliveries, the railroad terminals are kept clear, freight congestion is reduced, and the consignee is relieved of all worry concerning the delivery of his shipments. It has been stated that the average freight train spends twelve hours in the terminal for every hour it is on the road. Store-door delivery releases these cars, and the benefit is traceable through all of the ramifications of the modern transportation system.

The operating of trucks on schedule provides, in effect, a motorized railroad. Sixty-five per cent as much freight is handled between Cleveland and Akron by truck as is hauled by rail.

In this same territory one 40-mile route relieves the railroad of the demand for 800 freight cars per week. It is estimated that there will soon be 600 motor express lines in operation throughout the whole of the United States.

Foreign Truck Makers Test Solid and Pneumatic Tires.

Many foreign truck makers are adopting the use of pneumatic instead of solid tires and are conducting exhaustive series of tests to compare the performance of trucks with the two different kinds of tires.

The evidence so far, says a distributor of one of the truck companies, is in favor of the pneumatic-tired vehicle. It is said that the attention of the French truck makers was first called to the question of the use of pneumatics by the large percentage of breakages of stub axles, wheel


Radius Rods Features of the Armleder Motor Trucks.

Radius rods which are of different construction are featured in its new motor trucks, says the O. Armleder Co. These rods are the same length as the rear propeller shaft and are mounted parallel to it. This action, as the load springs up and down, is said to make it unnecessary for the propeller shaft to slip in the joints.

The Armleder radius rods are mounted both parallel to the ground and to the frame, so that as the frame springs up and down, the rear axle is not constantly pushing backward and jerking forward, as is sometimes the case when the front of the radius rod is mounted higher than the rear end. These thrusts against the rear axle are apt to throw the rear wheels out of line with the front wheels, causing wear on rear tires as they drag sideways.

Some form of radius rods, the manufacturer says, is necessary on every motor truck to hold the rear axle in place. If radius rods are not used, the front half of the rear spring must answer this purpose, and in this construction the slapping of the rear wheels is very pronounced.

These radius rods are claimed to be the only construction built that removes the necessity of the propeller shafts slipping in the universal joints, the only construction that is mounted exactly parallel with the rear propeller shaft, and the only radius rods that do not kick the axle backward and jerk it forward.



Easy Riding
and
Guaranteed

Sell the Spring that's Built for Emergencies

A CAR rolling gently along on a smooth road at a comfortable gait doesn't cause much worry about springs.

Under such circumstances, a fairly good spring may do. But the terrific jars of unforeseen bumps or hidden holes in the road with the car at high speed, require a spring that's more than fairly good.

Those emergencies come sometime to every automobilist, and the dealer, therefore, should choose the spring he sells with the emergency in mind.

There is no reason why any conscientious dealer should be satisfied with any less than Harvey Springs. For these famous springs, recognized as the highest standard manufactured, are backed also by an unexcelled service to dealers. No matter what part of the country you are located in, there's a Harvey jobber near you who can supply you immediately with the Harvey Springs for any make or model of car.

Harvey dealers are well supplied with sales helps, movie slides, window decalcomanias and inside wall posters as well as the helpful Harvey Catalog.

Write for the Harvey Catalog telling how these better springs are made and giving specifications for 1,000 different kinds.

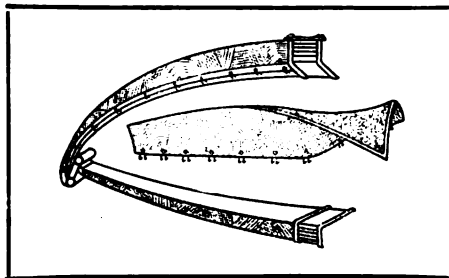
The Harvey Spring & Forging Co.
104 B 17th Street
Racine, Wis.

Harvey
RACINE
SPRINGS

Accessories — They Bring in Money

New Lubricating Spring Cover for 1920 Introduced.

An improved spring cover for 1920 that is held in place by small steel hooks fastening the edges together on the under side of the spring is brought out by the Woodworth Mfg. Corp. The cover, the makers say, is lined with heavy felt wicking which is saturated with oil before the cover is put on and which will hold oil



Woodworth's New Spring Cover.

enough to lubricate the springs for at least one to two years.

The covers are said to be easily fitted to any make of car. They are made of two grades, one having an outer covering made of oil and waterproof leather, and the other having the outer covering of imitation leather which is also proof against the action of oil and water.

The manufacturers further claim that this cover makes an easy-riding car, prevents squeaks and broken springs and

saves the tires through increased resiliency.

Write for trade prices and further information to the Woodworth Mfg. Corp., Niagara Falls, N. Y., mentioning the American Garage & Auto Dealer.

Interesting and Attractive Display Cards Offered to Dealers.

A large cutout, showing the Whistler automatic tire valve in place on a cardboard tire, will be sent to any dealer who desires it for counter display. It is an attractive sign, 12½ ins. wide and 7½ ins. high, done in black, green and gray. It should prove practical for demonstrative and explanatory purposes. In addition to the counter card, a handsome window card, measuring 14 ins. by 18 ins., in orange, blue and white, will be sent upon request.

A new invention is always interesting to the motorist and the "Whistler" as "something new" is proving most popular. This, however, is not the real reason for its popularity. Motorists now realize that it is a tire saver and that it is to be depended upon. Its pronounced whistle tells them

when their tires have just enough air. There is no more need for a pressure gage.

The makers claim that this invention means lengthening the life of the tire 60 per cent., and a saving in gasoline of from 15 to 20 per cent. Ordinarily tires do not wear out. They usually give out or blow out. The "Whistler" was designed for the purpose of telling the motorist when he is safe, so that he can ride with the knowl-



The Counter Display Card Showing "Whistler" in Place.

edge that his tires are properly inflated.

The Safety Tire Valve Corp. is willing and anxious to co-operate with the dealer in every way. In addition to its big newspaper advertising campaign, it not only offers the display cards mentioned and illustrated on this page, but furnishes two mailing cards to be sent to customers, telling them the story of the "Whistler." "Let's go over the top together," is its slogan. Let it help you.

If you want the display cards and are interested in the valve, further particulars can be obtained by writing the Automatic Safety Tire Valve Corp., 1765 Broadway, New York City, mentioning the American Garage & Auto Dealer.

New Light-Weight Metal - Alloy Piston on Market.

Engineers have for several years been working on a piston made of a metal which was light in weight, but did not require the extra clearance due to the expansion of the aluminum alloy.

A piston has been developed by the Butler Mfg. Co. which is made of bearing metal—light in weight. The skirt is split, which compensates for expansion and contraction with an especially constructed expansion ring placed inside the skirt which holds the piston snug to the cylinder wall, thereby transferring the heat from the piston into the cooling system. This keeps

Photograph of Large Window Display Card—Colors Orange, Blue and White—Very Attractive and Practical for Display Purposes.

A Complete Outfit

Perhaps your establishment demands a compressor outfit of peculiar arrangement—possibly no assembled machine would conveniently fit the available space or meet other requirements. If this is your problem, the Brunner line includes various items from which you can select the proper apparatus and set it up to meet the conditions. Either belt driven or motor driven compressor models are offered—also a complete line of valves and fittings.

For instance, the No. 1 Outfit:—A No.102 compressor with proper tank, gauge, hose, valves, etc., all boxed and ready to install in the manner best adapted to the location. Full instructions are furnished and any questions will be answered by Brunner engineers. This outfit or another similar Brunner outfit, may be just what you have been seeking.

Consult your jobber or write us giving full details of your air service problem.

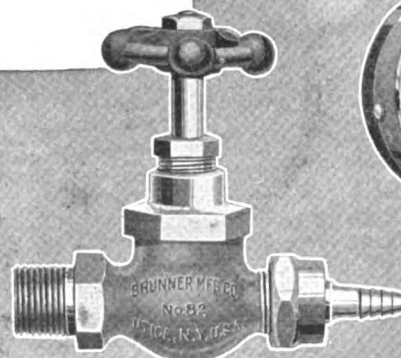
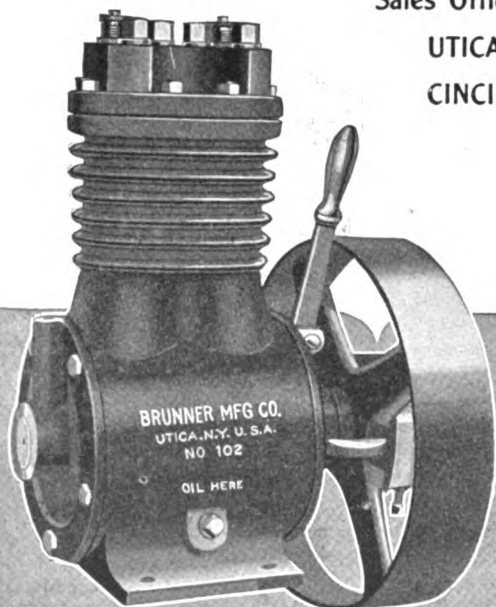
Brunner Manufacturing Co.

Works: Utica, N. Y.

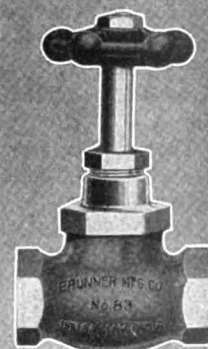
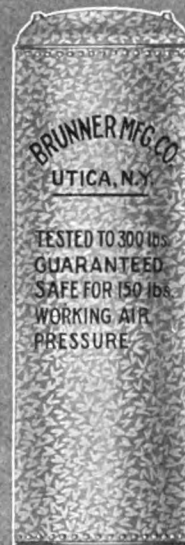
Sales Offices:

UTICA, N. Y.

CINCINNATI, O.



BRUNNER

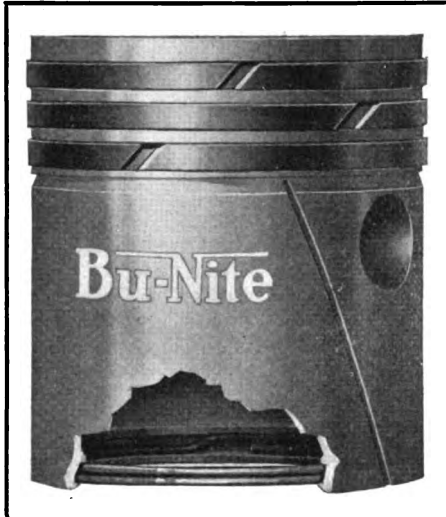


Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

oil from working into the combustion chamber, also prevents piston slaps, and holds compression.

The manufacturer claims that the consumption of lubricating oil is reduced and the mileage is increased, owing to the lightness of the bearing metal, which reduces the wear on cylinders and connection rod bearings.

More complete information can be ob-



New Light Alloy Piston.

tained by writing the Butler Mfg. Co., 1120-1124 East Georgia St., Indianapolis, Ind., mentioning the American Garage & Auto Dealer.

A New Automobile Exhaust Heater for Protection Against Cold.

A new automobile exhaust heater for the comfort and convenience of motorists is marketed by the Triple Action Spring Co.

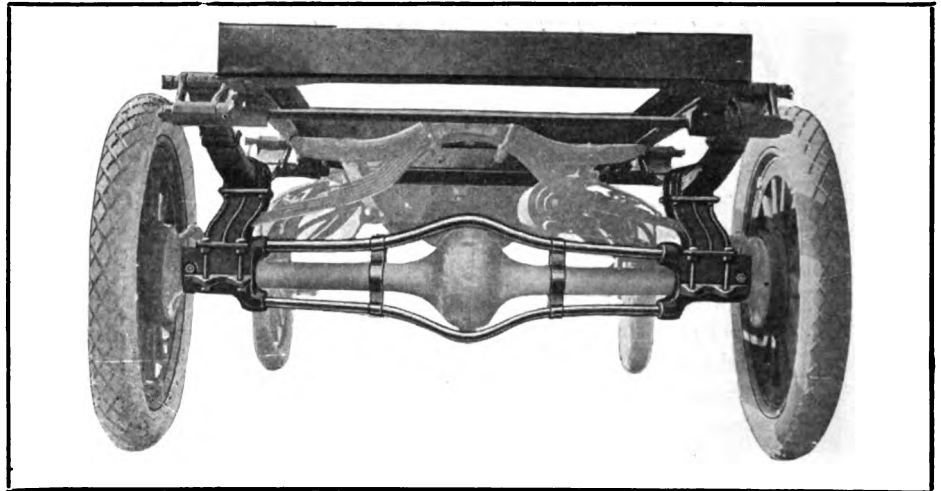
The manufacturers claim that all motorists will like the Temme heater for nine reasons:

In the first place, it is easily installed, and there is no extra maintenance or loose parts to become noisy; the continuous circulation of air around the efficient multiple-finned radiators will heat any ordinary car; the one-piece casting prevents the escape of exhaust gases; as the cast iron radiator is insulated from all woodwork, there is no danger of fire; the convenient,

prompt, and complete control on the dash is always in reach of the hand; the spring trap at the bottom of the housing facilitates the removal of all dirt and waste whenever necessary; there is no upkeep

Attachment for Converting Ford Into One-Ton Truck.

An attachment which converts an old Ford chassis into a one-ton truck is manufactured by the Affordable Motor Truck



Rear End of Ford Showing Attachment for Converting Ford Into One-ton Truck.

expense; the heater will fit into and provide heating comfort in any type of automobile; and it is reasonable in price.

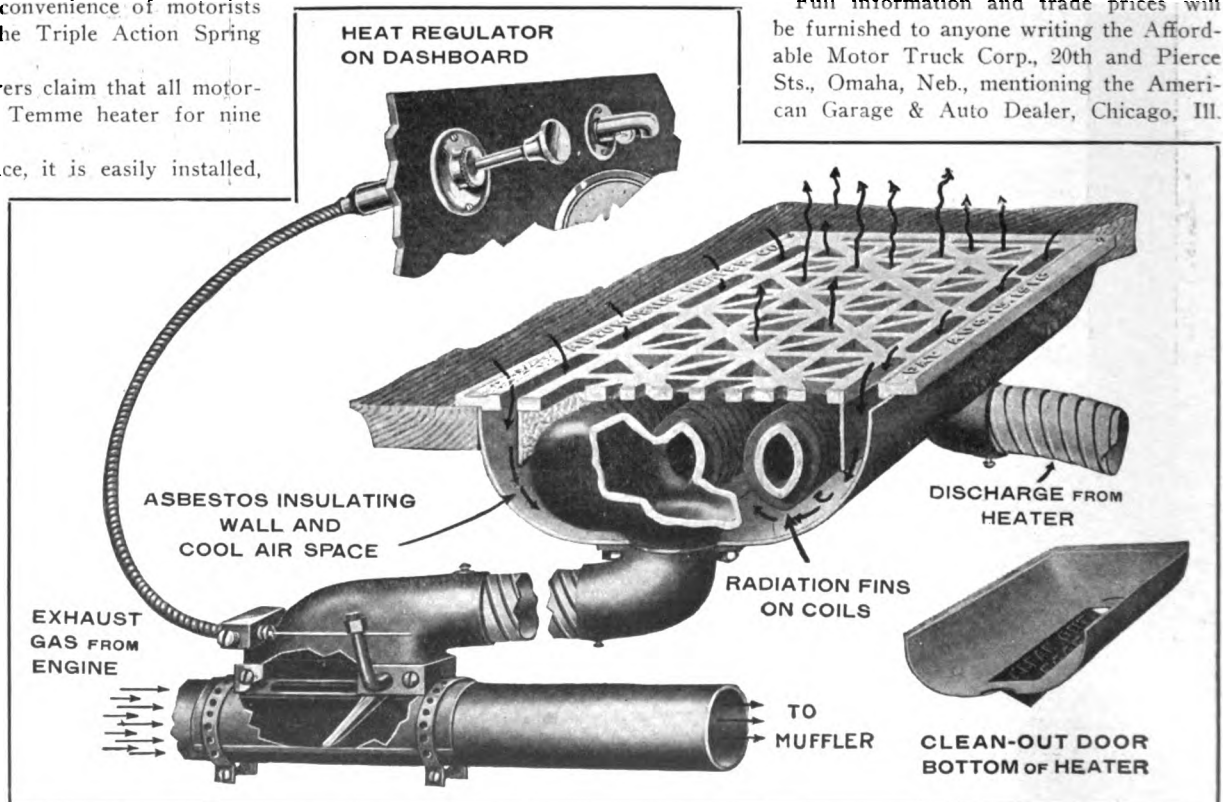
The Temme automobile exhaust heater should be of real assistance in keeping the cars in your vicinity "on the go" this winter. With this heater the owner will get 100 per cent service out of his car and the more business the garageman will get through natural channels.

For information and trade prices write to the Triple Action Spring Co., 55-57 E. 28th St., Chicago, mentioning the American Garage & Auto Dealer, Chicago.

Corp. This unit is said to increase the life of the integral parts of the Ford 50 per cent. That it also prevents side swinging and eliminates wear and tear caused by vibration and jar is also claimed.

The strengthening of the Ford is accomplished by the use of two heavy springs and an extra long frame. In this way the load is balanced at all times and the strain on both sides is equalized. By the use of larger bearings, which rotate on the Ford rear axle housing and make it full floating, the pulling power of the motor is increased.

Full information and trade prices will be furnished to anyone writing the Affordable Motor Truck Corp., 20th and Pierce Sts., Omaha, Neb., mentioning the American Garage & Auto Dealer, Chicago, Ill.



The Temme Automobile Heater Which Has Nine Features for Your Consideration.



The needs of merchants have guided National Cash Register improvements

“WHAT the merchant needs” always has been—and always will be—our basic idea in making cash registers.

This business, as it stands today, is the result of constant study of merchants’ needs.

Every suggestion that we receive is investigated. The practical ones are adopted and given very exacting mechanical tests before they are manufactured.

During the past 10 years we have made 6,508 improvements in our product.

These improvements were added so that National Cash Register users could be supplied with machines that would give them the utmost possible service.

Modern National Cash Registers are practical, useful, accurate, and durable—the best we can make.

Nationals are now used in 296 lines of business

The National Cash Register Company, Dayton, Ohio
Offices in all the principal cities of the world

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Garage Equipment for Better Efficiency

New Tool Chest for Mechanics or Garages Is Announced.

A new tool chest which the makers say is adapted to the uses of mechanics of practically all classes has been placed on the market by the Union Tool Chest Co.

The frame of the chest is made of thoroughly kiln-dried oak. The joints are lock-cornered and the top and bottom are rabbeted in, glued and nailed. The tray is fitted with movable partitions, both light and strong. By means of a permanent fastening to the cover, it is automatically raised out of the way when the chest is opened. When the lid is closed, the tray is flush against the cover, holding the contents in place if the chest should be overturned.

A handle of leather, steel cored, is attached with cotters. The trimmings are polished nickel, and the lock is a twelve-key change with two milled-slot, flat keys. The chest is finished in golden oak.

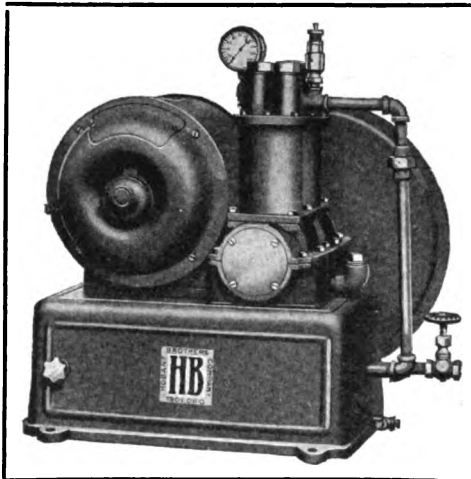
Write to the Union Tool Chest Co., Rochester, N. Y., for further particulars and trade prices, mentioning the American Garage & Auto Dealer.

New Automatic Large-Capacity Air Compressor on Market.

An automatic, large capacity, air compressor is the latest device brought out by the Hobart Brothers Co. It is designed to relieve the garageman of all trouble and worry in connection with providing free air for patrons of his garage.

The new compressor, the makers state, is a self-contained unit, furnished complete and ready to operate simply by connecting to the power lines now in any garage. It consists of an ample capacity $\frac{3}{4}$ to 2 h. p., ball-bearing motor, operating quietly without any attention whatever, due to the fact

that all gears run in oil. A combination of special Bakelite cloth pinion and special cut steel gears promises efficiency and quiet running. This motor operates a large size two-cylinder slow-speed pump, making 180



Automatic Large-Capacity Air Compressor. strokes a minute and pumping three cubic feet of air per minute. Special safety valves are provided to guard against pressure becoming too high.

The chief feature of the new compressor, the manufacturers claim, is that it is absolutely automatic in operation and when once connected to the garage power lines will furnish an ample air supply at standard pressure without further attention.

All bearings and gears run in oil and a special splash lubricating system keeps the pump operating in oil. There are no belted connections to waste power and demand attention and the geared motor drive of the outfit makes it impossible for the motor and pump to get out of alignment. The entire unit is mounted on an iron base. The compressor can be installed in any garage in 15 minutes' time. It can be connected up to the pressure tank already in the garage, or can be furnished with a pressure tank, at the buyer's option.

Write for particulars and trade prices to Hobart Bros. Co., Troy, Ohio, mentioning the American Garage & Auto Dealer.

Electric Battery Oven Designed to Save Time and Labor.

An electric battery oven designed to make jar and cover removing easy, to eliminate breakage and wasted time, is marketed by the Service Station Supply Co.

As compared with heating the battery top with a naked flame, the Ayrate electric oven, the manufacturers claim, has the distinct advantage in that no labor is required while the battery is being heated. The cells are not only heated rapidly, it is

said, but thoroughly and evenly, and without burning or charring the tray and rubber parts. The danger of explosion from igniting gases in the cells is eliminated.

Full particulars and trade prices can be obtained by writing the Service Station Supply Co., Detroit, Mich., mentioning the American Garage & Auto Dealer.

Dry Heat Vulcanizing Equipment Embodies Several New Features.

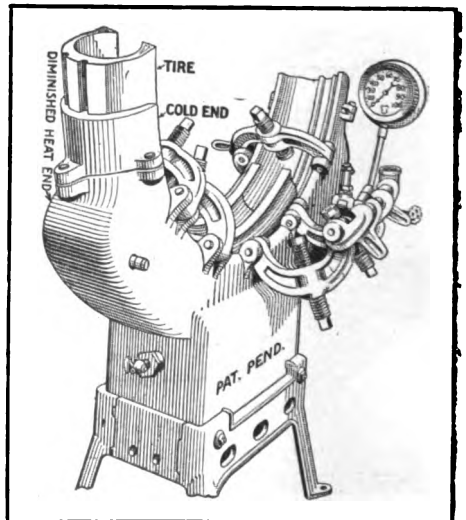
"The old kettle cure method has long since been discontinued," says the F. M. Duncan Mfg. Co., makers of the Duncan perfected dry heat vulcanizing equipment.

By the use of the new moulds the makers claim the many imperfections of the old method are eliminated, and the tire is given an added mileage comparable with a new tire.

These moulds have been planned to meet the demand for an equipment which will cure laps and sides smoothly and evenly. The finish is so perfect that it is said an expert cannot distinguish a re-treaded tire from a new tire when mounted, even after the tires have been used several thousand miles. New features are:

Special cold ends which do not melt the rubber; extra heavy and readily adjusted clamps; screws of special construction; heat reduction of sides to prevent over-curing at the lap; large gas burner which raises steam in 30 minutes; a large boiler constructed with a corrugated or double-arched bottom; a machine-cut and designed mould cavity which allows an even pressure of the sand bag in all directions; standard ribbed type treads; and ammonia semi-steel castings.

Prices and further particulars can be obtained by writing the F. M. Duncan Co., 114-16 East Ohio St., Chicago, mentioning the American Garage & Auto Dealer.



Vulcanizer Built on New Principles.

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....
.....
.....

Name
Address

GLOBE

(two stage)

AIR COMPRESSORS

meet all requirements

Globe Air Compressors were the original two-stage compressors—we were the first to realize that something more powerful than a "one lung" was needed. In our two-stage types, we produced more pressure than had hitherto been possible. Consequently when pneumatic truck tires came into general use, GLOBE COMPRESSORS were equal to the task of inflating them.

It means a great deal to the garage or service station to be able to furnish air service to trucks using pneumatic tires. The quantities of gasoline and oil these trucks use run into money and their expenditure for parts and repairs is considerable.

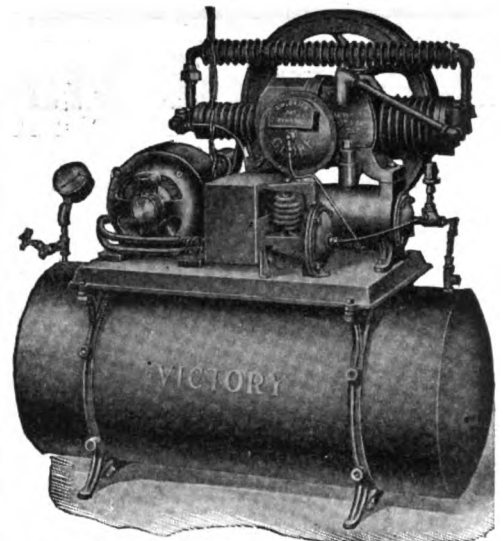
This business logically goes to the place that gives them dependable air service.

Consider the ever increasing use of pneumatic truck tires—then investigate GLOBE COMPRESSORS.

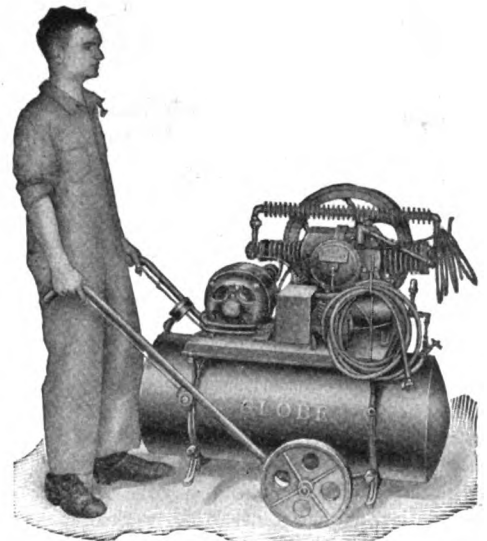
You will find that these compressors not only furnish sufficient pressure, but are economical in the use of power, and are extremely dependable and long lived.

Full particulars on request

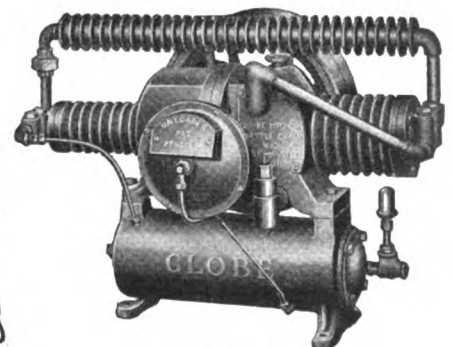
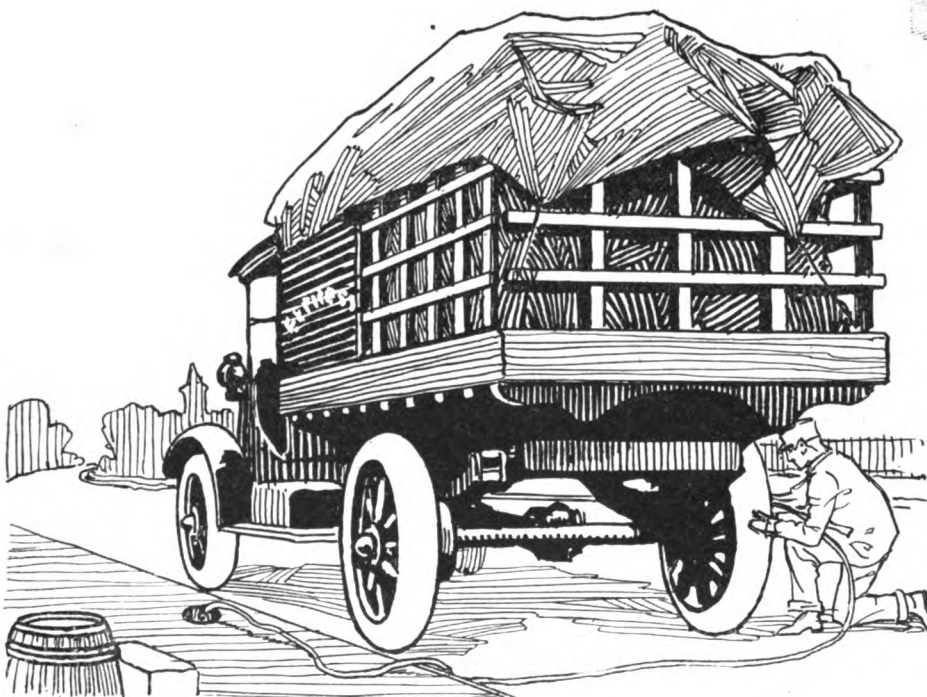
GLOBE MFG. CO.
Battle Creek Michigan



"VICTORY" Complete Automatic Motor Drive Unit



"VICTORY-PORTABLE"



GLOBE TYPE B
Two Stage Compressor for
Belt Drive

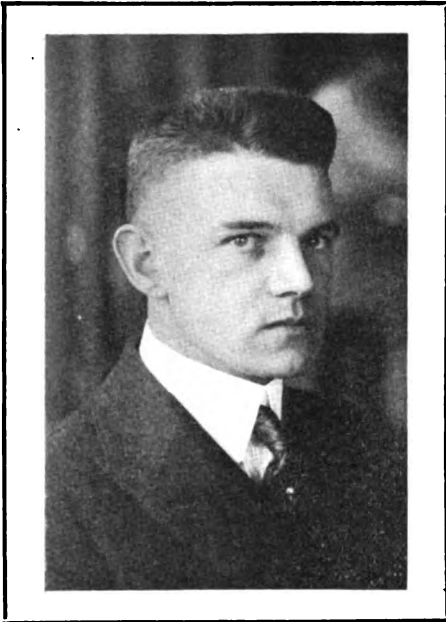
Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers

News of Manufacturers and Jobbers

Joins Acason Motor Truck Co. As Advertising Manager.

After resigning his position as advertising manager of the Standard Motor Truck Co., J. G. Cashin has accepted a similar position with The Acason Motor Truck Co., Detroit.

Donald F. Whittaker, who has held the



J. G. Cashin, Advertising Manager of the Acason Motor Truck Co.

joint title of advertising manager and assistant sales manager of the Acason company, will relinquish the duties of the advertising department to Mr. Cashin and will devote practically all of his time to his duties as assistant to Vice-President and Director of Sales H. A. Conlon.

Sprague Tire & Rubber Co. Enters Ninth Month of Production.

On September 1, the Sprague Tire & Rubber Co., of Omaha, Neb., entered on its ninth month of production with an output of 350 tires and 500 tubes a day. It has planned to increase its output to 600 tires and 1,000 tubes per day by the use of new machinery which has been ordered.

Its tires are stated to be made oversize, hand-built, and to carry extra plies of Sea Island fabric. The tubes are unusually heavy and are made by the laminated process.

At the age of 12 years, E. H. Sprague, president of the company, started as errand boy in the rubber business in Boston. Five years later he entered the employ of the American Rubber Co. When the United States Rubber Co. was organized, Mr. Sprague became associated with it and remained with that organization for 32

years. In 1900, he was elected president of the Omaha Rubber Co. and continued in that capacity until about two years ago.

In eight months the Sprague company is said to have developed jobbing accounts in 26 states, and is now establishing export connections.

Eastern and Western Representatives of Acme Co. Announced.

It is announced that the Acme line of 1, 1½, 2, 3½ and 5-ton worm-drive trucks is now handled on the Pacific coast by the Douglas Boswell Co., at Sacramento, Cal. This company will operate in the State of California and Nevada as far east as Elko county. The Boswell company is well known on the coast through its former connection with the automotive industry some time ago.

The Acme Motor Truck Co. also announces the formation of the Acme Motor Sales Co. of Baltimore, Md., which will have the entire States of Maryland and Delaware, and the District of Columbia.

Attractive Nokorode Window Display Produces Sales.

A very attractive window display advertising Nokorode soldering paste was recently shown by a hardware dealer in Providence, R. I.

Cans of various sizes of Nokorode were displayed, also Nokorode repair kits, and the whole window was sprinkled with ad-

vertising material which produces better work with less labor and is especially adaptable to automobile repair work.

They will furnish material for such a window display, as is shown in the accompanying illustration, to dealers who are interested. Write for particulars and trade price lists to The M. W. Dunton Co., Providence, R. I., mentioning the American Garage & Auto Dealer.

Cleveland Company Begins Work on New Factory Building.

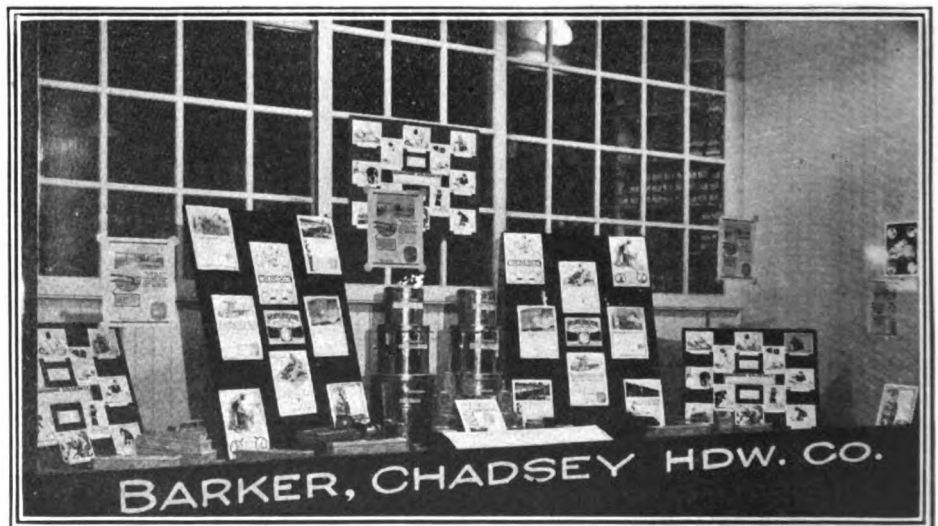
Work has been begun on a \$200,000 addition to the plant of the Cleveland Automobile Co., Cleveland, Ohio. The new factory unit is being erected adjoining the present plant of the company which was completed but a few months ago. The plant has fixed a daily production schedule of 150 cars.

Fairbanks Service Station Equipment Catalog Issued.

The new service station equipment catalog which has been issued by the Fairbanks Co. should be of unusual interest to garagemen.

In this catalog are 47 pages of non-technical, descriptive matter accompanied by clean-cut illustrations of special labor-saving machinery and tools for Ford and Fordson service stations.

Among the various things listed are: Bearing and burning-in, motor test, and



The Attractive Nokorode Window Display Shown by Live Dealer in Providence, R. I. advertisements taken from the various trade papers and current magazines.

The display was artistically arranged as can be seen from the accompanying photograph and attracted considerable attention which resulted in many sales.

The manufacturers of Nokorode claim

running-in stands; combination engine, front and rear axle stands; boring machines and re-babbiting jigs; and the various special tools which are used in overhauling Ford cars and tractors.

In addition to the special tools and jigs, the company also lists a complete line of

VALVE REGULATES TIRE AIR PRESSURE

When Enough Air Has Entered Auto Tubes, Invention Warns.

An automatic pressure regulator for automobile tires, wherewith an exact and even pressure can be maintained without bother or guess work, has just been put on the market. It is manufactured by the Automatic Safety Tire Valve corporation.

Motorists welcome the new device as the invention that solves the difficult problem of maintaining fixed tire pressure. Although this is essential to the economical operation of the car and of vital importance to the motorist, it has been hard to accomplish without considerable trouble. The ordinary tire gauge is bothersome to use regularly. Rocking the car or kicking the tires to determine the air pressure in the tires is unreliable, at best, and often starts a break in the tire fabric.

The new automatic pressure regulator is permanently attached to each tire valve in place of the dust cap. It is adjusted by means of a movable collar, calibrated to read pounds of pressure. When the tires are inflated the regulator automatically shuts off the air when the set pressure is reached, at the same time giving warning by a distinctive whistling sound. This whistle is caused by the excess air escaping through a port in the side of the regulator.

In construction the automatic pressure regulator is much like an ordinary tire gauge. The movable collar around the top, with which it is set for any desired pressure, controls a ball and spring valve inside which will admit no air after the set pressure is reached. The excess air, whistling through the escape port, gives audible evidence that the pressure is right.

After the regulator is once attached and set it needs no further attention. When the tire is to be inflated the hose connected is attached in the usual manner. At the whistle warning the air hose is removed and the motorist goes on his way, secure in the knowledge that all of his tires are properly inflated.

As a large percentage of tire troubles is due to incorrect inflation, the importance of the automatic regulator is easily seen. To get the fullest possible mileage and ensure freedom from usual tire troubles, each tire must have the correct air pressure—not once or twice a week but all the time. With the automatic regulator this is possible. Results of its use are seen in fewer blowouts, greater mileage to the gallon of gas, longer tire life with greater total mileage for each tire, and lower repair bills.

**Newspaper Clipping
Showing How The
Press Heralded the**

Whistler
TRADE MARK
'IT WHISTLES WHEN ITS HAD ENOUGH'

The appearance of the Whistler attracted attention all over America. Newspapers, magazines and trade papers endorsed it and hailed it as a distinct boon to the motorist.

Any product which receives such a welcome is sure of a permanent and growing success. The results so far have convinced us that the Whistler will make money for all who handle it.



**Introducing the
Latest Idea**

ROTARY AIR COMPRESSORS

For All Purposes

ADVANTAGES WORTH CONSIDERING

Slow Speed. No Vibration. Positive Displacement.
High Overall Efficiency. Very Low Cost of Upkeep.
No Expensive Foundations.

Easy to Install. Perfectly Balanced. Quiet in Operation.

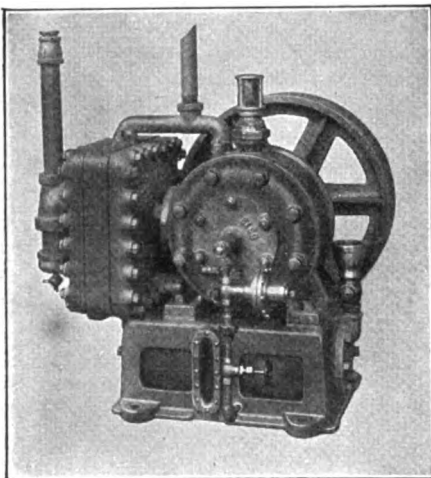
Check Valves on Discharge. No Valves on Intake.
Simple to Operate.

*Weights Less Than One-Half of Other Types.
All Bearings Hyatt Roller—"High Duty." Only
Five Moving Parts Always Running in Oil.*

Write for Descriptive Matter, Prices and Delivery

JACKSON COMPRESSOR COMPANY

Denver, Colorado, U. S. A.



Rotary Garage Compressors

garage equipment—compressors, electric motors, lathes, shapers, drills, cranes and tools in general.

Garagemen should write to the Fairbanks Co., Broome and Lafayette Sts., New York City, for Catalog No. 8, mentioning the American Garage & Auto Dealer.

Piston Ring Co. of Muskegon, Mich. Expands Present Plant.

A new addition is being added to the plant of the Piston Ring Co., of Muskegon, Mich. This company claims to be the largest piston ring concern in the world and the new addition is said to be necessary to take care of the increasing volume of business.

The company manufactures piston rings

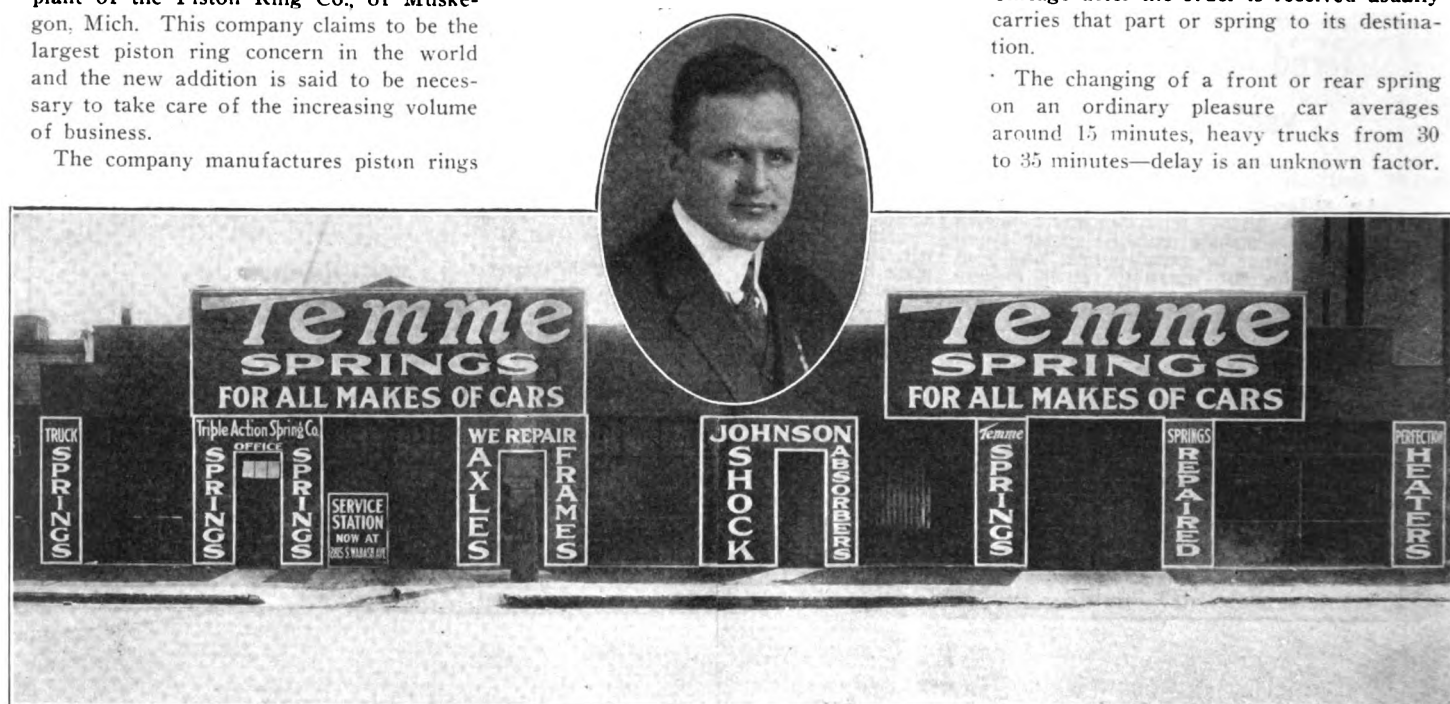
its present commanding status from a little one-man shop, starting with a mere \$15 working capital, and nursed his big idea of real service, high and uncompromising standard of quality first and foremost.

It has now become apparent that in the beginning his most valuable asset and capital was his great confidence in his ideal that a manufacturer could make a product as good as his competitor; could set his own pace, if he would endeavor to devote

time, and the patron can drive away happy and satisfied with reasonably-priced service.

In each of his 5,000 service stations throughout the country, there is carried a complete stock of the springs and parts most generally used in that locality. In the event that an unusual type is needed, even then, the replacement is only a matter of a few hours, because the wire is used and the first express train leaving Chicago after the order is received usually carries that part or spring to its destination.

The changing of a front or rear spring on an ordinary pleasure car averages around 15 minutes, heavy trucks from 30 to 35 minutes—delay is an unknown factor.



O. G. Temme, Founder and President of the Triple Action Spring Co. and the Present Factory Which Backs Service Ideal.

for automotive engine, pump and compressor concerns, furnishing angle-jointed, lap-jointed and specially designed rings. The production is now said to be considerably "more than one million rings a month."

The rings are made from a tough, close-grained gray iron, which receives the company's laboratory analysis before and after being cast. All rings are individually cast by the company's patented process.

The present building expansion is another step in the progress of this rapidly-growing concern and is the second addition of its kind in the past few years. The new additions to the plant promise to give the Piston Ring Co. a capacity of over 125,000 piston rings a day.

Success of Triple Action Spring Co. Attributed to Service.

The history of the Triple Action Spring Co., of Chicago, is a most interesting one. The phenomenal success of this company, the success of its products, its widely-distributed service station idea, are said to be solely revertible to the untiring efforts of its founder and present president, O. G. Temme.

Mr. Temme has brought his company to

greater attention to rendering "better service." And this idea of better service, to him, meant making spring replacements a matter of hours instead of days, or sometimes weeks, and eliminating the great unnecessary inconvenience to personal or business loss for his patrons.

It is also interesting to see that one man in the beginning could scurry over the territory for some orders, then return to his little shop in the alley, don his old leather apron and proceed to forge and scientifically temper the few springs he had sold. And while the light of the forge glowed on his dripping face, his vision, under the set inspiration of those big wonderful ideas, saw those grimy walls gradually expand a 360 sq. ft. limit floor space to the more than 50,000 sq. ft. now covered by his busy, modern-equipped plant on 28th St., near Michigan Blvd.

How great an advance this means is made pleasingly plain to the motorist or truck owner whose car goes out of commission because of a broken spring. In times past it meant days or week of patient waiting. But Mr. Temme has now made it possible through the Temme spring service stations to accomplish the replacement of a leaf or spring within an hour's

Twelve-hour service is Mr. Temme's invariable rule and it was established with full consciousness of the thousands of varying styles of springs with which many motor vehicle manufacturers equip their cars. This factor requires Mr. Temme to carry more than 140,000 springs in his warerooms ready for shipment at only a few minutes' notice. So varied is this stock assortment that it is seldom necessary to make a special spring for any order, but even then that spring goes forward within the inexorable 12-hour limit.

In an emergency of this kind, all thought of profit is abandoned; it is to avoid such loss of time that the stock of ready-to-ship springs comprises practically every model of almost every car built since 1903.

In addition to Temme springs, the company also manufactures the Johnson shock absorber, which is built on the double principle of absorbing shocks and smothering the rebound. Another product is the recoil check. A new attachment recently introduced is the new automobile exhaust heater for protection against cold weather.

Service with the highest possible quality of the product behind it is the combination to which the Triple Action Spring Co. attributes its success.

Treat it rough ! DURACORD EXTENSION LAMP



YOU can pull the cord on a Duracord Extension Lamp around corners without fear of damaging it. The cord is genuine Duracord, the portable electric cord with a heavy woven fabric covering—*not braided*.

Laboratory tests as well as actual use have conclusively proven that Duracord will outlast ordinary braided cord many times over.

There is no metal to cut through the insulation or scratch polished surfaces as on a steel armored cable. The cord is gripped in the lamp by a patented "holdfast" fitting that *won't*

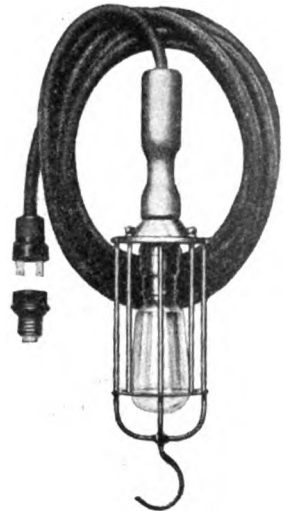
pull out. The guard is strongly made and protects the bulb to an exceptional degree.

This lamp in your garage or shop will mean the end of time-wasting tinkering with poorly constructed lamps and unsatisfactory cords.

Each lamp complete, all wired up ready for use with 20 feet of genuine Duracord. Packed in an individual box.

Priced as following (excluding bulb)

| | |
|------------------------------------|-----|
| <i>Light weight</i> | \$5 |
| <i>Heavy duty, as illustrated,</i> | \$6 |
| <i>Vapor proof</i> | \$8 |



TUBULAR WOVEN FABRIC CO., Pawtucket, R. I.

THE service the tractor gives the user depends entirely upon the lubrication. Inaccessible parts can be lubricated with either hard or soft grease with the Rose Tractor Taper Nozzle Grease Gun. 19½" long, by 1½" diameter.

List Price \$2.50

Handled by Most Jobbers and Dealers

Manufactured and Guaranteed by

J. H. Haney & Company
Hastings, Neb.

**ROSE
TRACTOR
GREASE GUN**

Lubricates with out waste



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Catalog on Starting, Lighting and Ignition Systems Published.

An interesting and instructive catalog has just been issued by Gray & Davis, Inc. It contains a complete and detailed description of the new starting, lighting and ignition systems of the company, and also describes its new line of automobile lamps. In gray and gold and green, the booklet is attractive to the highest degree and is filled with instructive illustrations.

A copy of this catalog can be obtained by writing to the advertising department, Gray & Davis, Inc., Boston, Mass., mentioning the American Garage & Auto Dealer.

Outlook Co. of Cleveland Establishes Eastern Sales Branch.

A sales office has been established at 250 West 54th St., New York City, by the Outlook Co., of Cleveland, Ohio, manufacturers of Outlook windshield cleaners, Outlook rubber patch and Outlook luster.

This office will be known as the Eastern and export sales branch, and will take charge of all business in the New England States and in the Eastern and Southern States as far as Tennessee. It will also look after the company's export business.

Marlin-Rockwell Properties Form New Organization.

A new organization of all Marlin-Rockwell properties engaged in the production of S. R. B. bearings has been formed and will be known as the Standard Steel and Bearings, Inc. The following are the constituent plants: Standard Roller Bearing Co., Philadelphia; Braeburn Steel Co., Pittsburgh, Pa.; Rockwell Drake Bear-

ings Division, Plainville, Conn., and Norwich Division, Norwich, Conn.

As soon as possible the general sales and accounting departments of the combined enterprises will be concentrated at the executive offices in New York.

New Catalog on Chain Issued by Ohio Company.

An attractive catalog giving some interesting information about chain and its uses has just been issued by the Chain Products Co.

This catalog deals fully with all kinds of weldless chains and the many purposes for which they may be used. It is well illustrated by a succession of drawings.

Anyone interested in chains can obtain one of these catalogs by writing to the Chain Products Co., Cleveland, Ohio, mentioning the American Garage & Auto Dealer.

New Device to Be Marketed by New York Sales Co.

A new device known as the Auto Spark Lite, a cigar lighter, is being placed on the market by the J. C. McAdams Sales Co., Vanderbilt Bldg., New York City.

This article was invented and patented by Herman Schlaich, chief experimental engineer of the Moto Meter Co. of Long Island, and is being sold by the J. C. McAdams Co.

Black & Decker Co. Start Erection of Plant at Towson Heights.

Announcement is made that the general offices of the Black & Decker Mfg. Co. have been moved from 105 South Calvert street, Baltimore, Md., to Towson Heights,

Baltimore, Md. Building operations on the new plant of the company at that location are now well under way.

The new factory will be 100 feet deep and 200 feet wide, erected on the west side of the present plant and directly connected with it. With this addition the plant will have a total of 32,000 sq. ft. of manufacturing floor space, not including the storehouse, chemical laboratory, or the new office building.

It is planned to complete the new factory unit about December 1, and it is said that sufficient additional machine tool equipment will be installed to give the plant more than twice its present productive capacity.

Changes Occur in Chicago Branch of Buick Organization.

The members of the Chicago branch of the Buick Motor Co. are giving the hand of congratulation to D. A. Burke, who has accepted a higher executive position in another division of the General Motors Corp. Mr. Burke has an unusual record with the Buick Motor Co., and his new appointment is said to offer even greater and broader opportunities.

Announcement is also made of the appointment of Horace P. Carter as future manager of the Chicago branch. The Chicago branch covers Illinois, a part of Indiana, Iowa, Wisconsin and Missouri. Mr. Carter is said to be thoroughly familiar with the automobile situation in the Middle West. He is especially familiar with the Buick organization of this entire territory, as he has been continuously connected with the Chicago and Milwaukee houses in an executive way for the past five years.

Price \$4.00



Ask for the name of the Foster distributor in your territory.

Foster Auto Repair Creeper

A FLEXIBLE SPRING FABRIC that gives freedom of action and more actual working room under the car.
A STEEL FRAME that is indestructible.
AN ANCHOR that prevents slipping.
A LONGER SERVICE—making it the cheapest creeper to buy.

FOSTER BROS. MFG. CO., UTICA, N. Y.

Direct Representatives: For the Eastern and Southern States, Asch & Co., 16-24 W. 61st St., New York, N. Y. For the Mid-West: Jessop & Thompson, 1421 S. Michigan Ave., Chicago, Ill. Pacific Coast & Intermountain Territory: McDonald & Linforth, 739 Call Bldg., San Francisco, Cal.

Greater Resiliency Greater Strength

as well as

Being 100% Interchangeable
Make NEW ERA Better Spring Bumpers
A Thoroughly Satisfactory Investment.

These popular priced bumpers firmly attach to the frame of any make of car without cutting or drilling.

No vibration. Neat appearing. An exchange of arms makes them 100% interchangeable. These attaching arms are exchanged free and thereby eliminate dead bumper stock at all times.

"Better" Spring Bumpers are finished in either black enamel or in zinc nickel.

A truly remarkable Spring Bumper that embodies every conceivable advantage. Write for descriptive circular.

New Era Spring & Specialty Co.
1152 Hamilton Avenue Grand Rapids, Mich.

"Bermo"

"Enfin," says the Frenchman.

He means, "At last! I can do my own welding without the bother of sending it away. I can buy a BERMOWELDING PLANT

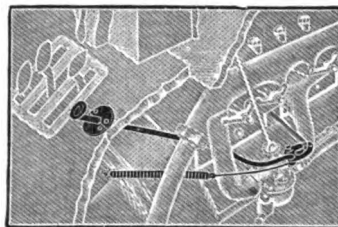
on such reasonable terms that it will only take me about four or five jobs to pay for it."

SO CAN YOU! Your's is the same opportunity.

Write now for particulars.

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With Your Engine Barely Turning Over You Can Speed It Up in an Instant



With an Ewald Foot Accelerator installed in your Ford car you can come to a stop with your motor running idly, without touching the gas lever. And when the signal to "go" comes, you simply step on the

E W A L D **FOOT ACCELERATOR**

and you are off like a shot. Your hands are always free to operate the steering wheel, horn or brakes. It is a necessity in the city, a great convenience in the country. There are 50,000 in use today. Fully guaranteed.

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Manufactured by

ROMORT MANUFACTURING CO., Oakfield, Wis.

Sales Department

THE ZINKE COMPANY, 1323 Michigan Avenue, CHICAGO, ILL.

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

Price F. O. B. Factory \$10.00

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Maxwell, Overland, and Studebaker cars.

DEALERS--If interested, write for further information

MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.

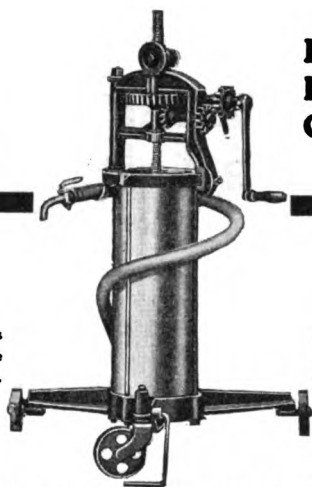


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**ENTIRELY
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Model K holds
20 lbs. grease
or 2½ gals. oil.



Model N holds
56 lbs. grease
or 7 gals. oil.

Ekern "Model N" Portable Garage Grease Gun

Undoubtedly there is scarcely any garage equipment which is absolutely indispensable; yet there are a few products which come mighty close to being necessary. Among these, our "MODEL K" and "MODEL N" PORTABLE GARAGE GREASE GUNS are very prominent.

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GANSCHOW GEARS

for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company

1002 Washington Boulevard
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**All the
"comforts" of home in the
modern train**

America's big railroad men during the past half century have devoted intensive efforts to making travel by rail more comfortable and enjoyable. We have, likewise, studied the problems of imparting comfort and pleasure to riding in a Ford, and as a result of our efforts

**You get that same "comfy" feeling with
W & C SHOCK ABSORBERS**

They help steering, prevent side sway, save tires, and stop the triangular pull that wears out the bearings.

Over 200,000 sets in use.
Write for our trade proposition.

P. H. WEBBER CO.
Hoopeston, Ill.

*The Original Double Arm
SHOCK ABSORBER*
W & C
For FORD CARS

Pondelick Brothers

**will
pay
\$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrounding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

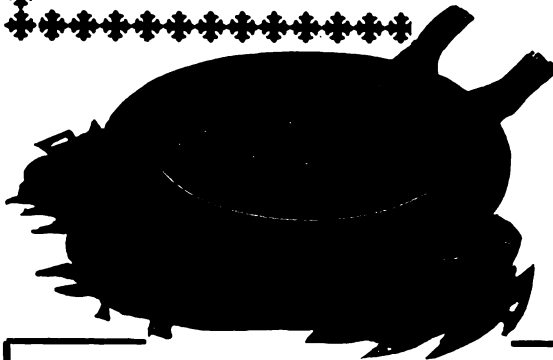
Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

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Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

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End Your Tire Trouble Forever



IT brings new happiness and releases you from the horrors of expected tire trouble, making your car more delightful. Think of the joy of riding along without the eternal fear of a puncture or blow-out. Think of getting 10,000 to 20,000 miles out of every tire—no vulcanizing, no patching, no repairing of any kind, doing away with your inner-tube forever by installing in your tires this wonderful and economical

National Rubber Tirefiller

This marvelous substitute for air is being used by thousands and thousands of satisfied car owners throughout the United States and many foreign countries. We have been manufacturing and selling it for more than seven years; selling last year more than 35,000 sets.

National Rubber Tirefiller is made of the best grade of rubber, cut in small particles, treated, molded and vulcanized by our special steam process, in sizes to fit all standard makes of tires. It is laid in your tires and not melted and poured in. It can be transferred from one tire to another. It will not freeze, melt or harden—fully guaranteed against deterioration in any form, or being affected by atmospheric conditions.

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DEALERS—We have a fine proposition for you.

National Rubber Filler Company
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Repair Any Auto or Auto Truck

Examine These NEW AUTO BOOKS FREE

Be an expert auto repair man. You can have the skill that makes every complicated trouble as easy to fix as taking out a spark plug. Learn every detail of all makes of cars and trucks. Know exactly how to find what's wrong and how to make all repairs quickly. These great new Auto Books show you how.

Make Money Repairing Autos

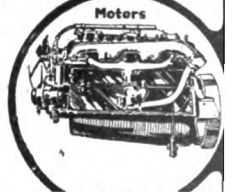
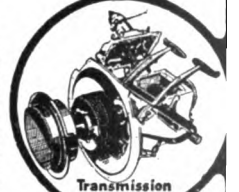
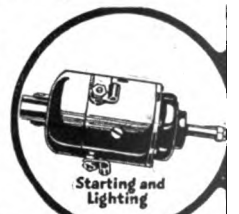
The limited output of new cars does not anywhere near meet the demand. Rebuilt cars are selling at a premium. Never before have expert auto repair men been in such great demand and made so much money. Now is your great money-earning opportunity in the auto repair business. Every mechanic, every chauffeur, every car owner needs this great New Library of Automobile Engineering.

50c a Week If You Decide to Buy

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Let us send you the complete six-volume set of Automobile Engineering for one week's examination. Read the simple directions for repairing every automobile trouble. Six thick volumes, 5x8 inches, flexibly bound in American morocco. 2650 pages, 2100 illustrations, wiring diagrams, etc. Everything in plain, everyday, language, simple to understand. If you decide to keep them, send only \$2 in seven days, and \$2 a month thereafter until the special introductory price of \$19.80 has been paid. The regular price is \$30, so you save \$10.20 by acting at once.



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**No profits lost if you
CALCULAGRAPH
your garage work**

When the time spent on repair jobs is "estimated" by the men there are bound to be errors. On some of these YOU lose. In course of a year these losses run into a considerable sum.

When you install a CALCULAGRAPH these losses cease because you have an accurate record of the actual time spent on every repair job.

Write for booklet.

The Calculagraph Company

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NEW YORK CITY



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Kindly hurry that order for Inflating Valves. We had no trouble with our Free Air Station as long as we used this Valve but when we had to put in another make, - the fun began.

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Buy NOW!

Waiting for lower prices before ordering that equipment you need or stocking these accessories your customers want is like sitting on a fence and waiting for your rich uncle to die. You lose more than you can possibly gain by a drop in prices.

To make 1919 your best year buy your requirements NOW.

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NOKORODE Insures a Perfect Soldering Job

The importance of dependable soldering on automobile work makes NOKORODE a necessity in every garage and repair shop. This soldering paste is compounded so carefully that the smallest particle contains every element of the flux. Hence it will do perfect work even on the most delicate jobs.

Used exclusively by leading car manufacturers and up-to-date repair shops.

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When Springs Break, put on

VULCAN
The Replacement Spring

This
display rack **FREE**
with first order.

Best known for

Best Quality—

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Best Profits—

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RICHMOND, IND.

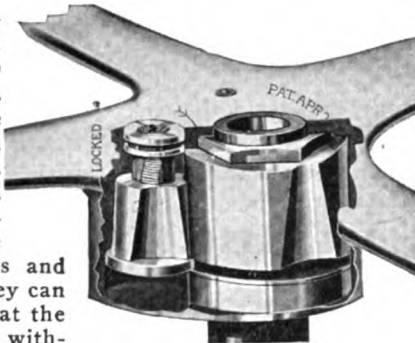


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"RELCO"

The Ultimate Automobile Lock

The lock that the motoring public has been waiting for. Gives absolute protection. Adaptable to any make of car other than Fords. Mechanically a wonder. Fitted with the King-Multiple-Tumbler Lock, capable of countless variations and for which no master key can be made. A half turn at the key locks or unlocks it without moving the lock from its position on the steering shaft. Once locked, car cannot be driven or towed. Powerfully made—no thief with a hammer can break the "RELCO."



Approved by the Underwriters' Laboratories, and affords 15% discount on insurance.

DEALERS: You will find a ready market for the "RELCO" Lock. Your profit is liberal. We also manufacture the famous MUELLER LOCK for FORDS.

Write today for particulars.

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Distributors in every state

"AM-PĒ-CO" PRODUCTS

Sell readily because their superiority is well known to the Motoring Public

AM-PĒ-CO" PISTONS for FORDS

Make the Ford motor flexible and smooth running—provide greater power and increased speed. "AM-PĒ-CO" Pistons are uniform in weight, mechanically accurate and true to measurements.

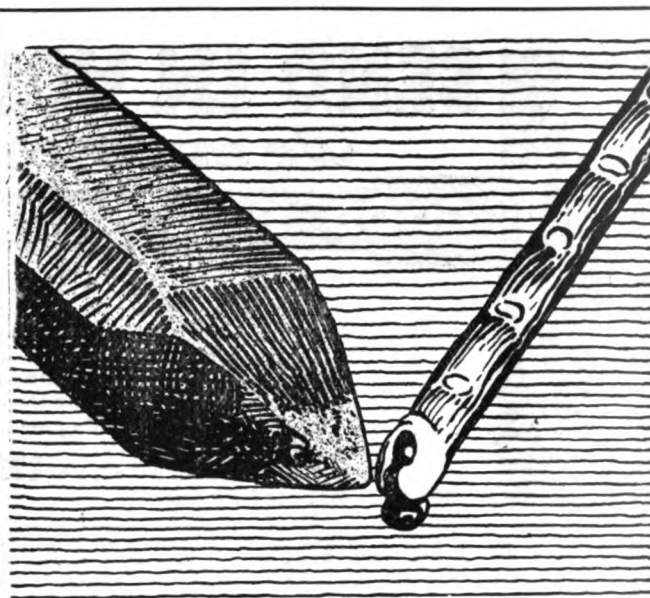
MARSHALLTOWN CUTOUTS are made to satisfy the most exacting demands. Valve has beveled knife edge that insures tight closing at all times. The longer used the tighter the valve becomes.

We also make the famous "AM-PĒ-CO" WHEEL PULLERS and BRAKE SHOES, both one- and two-piece. If your jobber does not handle "AM-PĒ-CO" Products, write us direct.

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General Selling Agent for

**American
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Every Drop of Solder Carries Flux With It

You can solder that auto repair job without the bother of a separate soldering flux by using a wire solder with the flux right in it.

Kester Acid-Core Wire Solder

has a core made up of little cells full of flux. As you melt the solder off, the flux flows out in just the right quantity to automatically take care of the fluxing.

Handier and Easier to Use

It is handier because you haven't the bother of preparing or even carrying any separate flux. It is easier because the flux feeds with the solder. Anyone, repairman or auto owner, can now do a first-class job, and do it quickly.

It is sold in one pound coils in cartons and on one, five and ten pound spools

Ask your supply house for it or write us for free sample.

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SEND IN YOUR OLD TIRES

We make them like new

GOOD FOR 5000 MORE MILES



There's money for you in those old tires that accumulate in your shop. Don't junk them or throw them away. Send them to us. No matter if they are punctured, rim-cut, sand blistered or blown out, our process transforms them into tires that are good for 5000 more miles. You can sell these tires at a handsome profit.

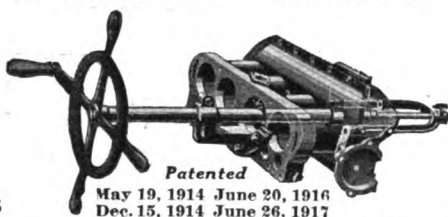
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REPAIRMEN — LISTEN!

The Heiser Improved Cylinder Reboring Tool for Ford Motors



Patented
 May 19, 1914 June 20, 1916
 Dec. 15, 1914 June 26, 1917

is the only Reboring Tool in the world that is self sharpening. It is the only Tool except expensive grinders that will not leave the finished cylinder slightly tapered toward the bottom. It is the only Tool that rebores between centers—this insures a finished cylinder, square with the crankshaft, round, straight and true. It is adjustable, and the only Tool that will rebores different sizes without losing the adjustment.

The best mechanic in the world can't build reputation without proper TOOLS and EQUIPMENT. The HEISER IMPROVED CYLINDER REBORING TOOL makes good shops out of poor ones and better shops out of good ones.

Write today for full particulars.

Heiser Special Tool Co., 115 Rogers Bldg., Kingston, Mo.

MEN WITHOUT PREVIOUS EXPERIENCE CAN GET INTO A VERY PROFITABLE FAST GROWING BUSINESS



Everyone makes money in the TIRE VULCANIZING BUSINESS. Profits 100% or more. Small investment. We are the pioneers in the manufacture of the dry cure vulcanizer.

THE VANDERPOOL VULCANIZING OUTFIT repairs tires by the correct method. We send you FREE TIRE REPAIRING MANUAL. If others have been successful so can you be. Write today for full particulars. In answering address Dept. G-19.

Wm. Vanderpool Co., Springfield, Ohio

GRAHAM SOCKET WRENCHES

Are turned from the best Solid Bar Stock and are Heat Treated. For

STRENGTH and RELIABILITY

They are unexcelled. Ask for dealer's discount.

Price
\$1.50



Graham Roller Bearing Co., Coudersport, Pa.

Put your repair charges on a profitable basis with



BAIRD TIMING DEVICES

Keep a check on your employees' time and learn exactly what each job costs. Automatic supervision turns losses into profits.

Prices moderate. Write today for booklet.

Baird Equipment Co.
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Keep your supplies in revolving cabinets like these

Systematic! Conveniently Accessible! Just like "rollin' off a log" to look up bolts, screws, etc., with this revolving cabinet. Everything at your finger tips, with nothing to burden your memory. Used by leading garages of this country.

Buy today from your jobber.
 Catalogue on request.

American Bolt & Screw Case Co.
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HBBATTERY CHARGING PAYS BIG PROFITS

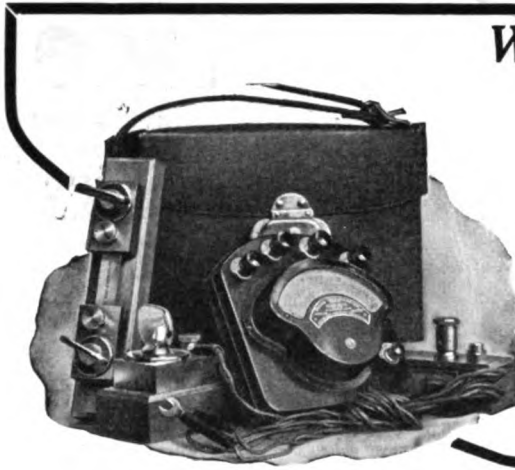
\$100 to \$200 CLEAR EXTRA PROFIT Each Month.
New Lower Price on This HB 500 Watt Charger.

Recharges 1 to 76-volt batteries for 10c to 15c each. Owner pays 75c to \$1.50. No attention save an occasional oiling. Any mechanic can handle battery business in a few minutes time each day. No electrical or mechanical knowledge required to install or operate.

Small Cash Payment Puts This HB Outfit in Your Garage. Balance on easy monthly terms. Profits easily carry payments. No burnouts, no expensive renewals—steady, dependable service with BIG PROFITS. Absolute Money-Back Guarantee. Tear out this ad and mail TODAY for information.



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 Successful Manufacturers Since 1893



Which Garage Man Gets The Money?

If you can repair and adjust Electrical Equipment, you will get the cream of the garage business. With the increasing demand for service of this sort, you must equip to handle the business, or lose it to your more enterprising competitor.

Weston

Model 280
**GARAGE
TESTING
INSTRUMENT**

is your one great and urgent necessity to enable you to locate electrical troubles quickly and apply the proper treatment to remedy them. Its possession will place you a long way ahead of your competitor not so equipped.

This instrument is extremely accurate, durable and serviceable. It is the most practical electrical equipment you can install.

The Weston Company is pre-eminent throughout the world in the production of highest grade Electrical Precision Instruments.

Prompt Shipments from Stock—Order Now!

WESTON ELECTRICAL INSTRUMENT CO., 30 Weston Ave., Newark, N. J.

Branch Offices in the Larger Cities

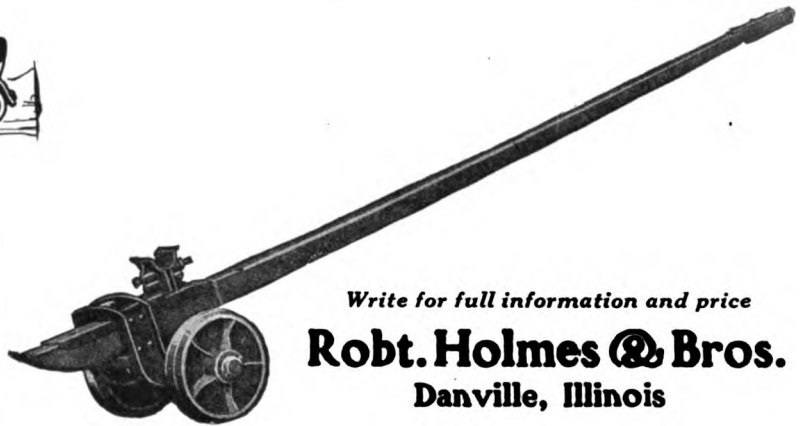


Wrecked!

When you get that call, be prepared to go to the rescue with a

Holmes Wrecking Truck

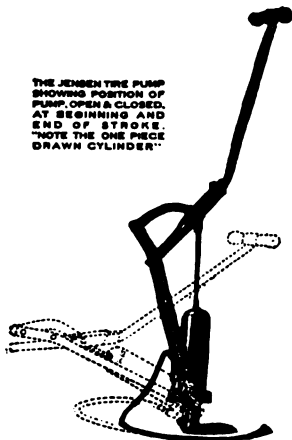
You can get the crippled car to your shop quickly and easily. The time and labor saved soon pays for it. Made of the best materials with ample strength for any job.



Write for full information and price

Robt. Holmes & Bros.
Danville, Illinois

THE JENSEN TIRE PUMP
SHOWING POSITION OF
PUMP, OPEN & CLOSED,
AT BEGINNING AND
END OF STROKE.
NOTE THE ONE PIECE
DRAWN CYLINDER



Tell your customers
not to break their
backs pumping tires

\$5.50

Jensen Tire Pump

Will produce 90 pounds pressure more easily than you can pump 65 pounds with the ordinary vertical pump, with one-quarter the effort and in half the time. Well made throughout.

Discounts on request

The W. H. Howell Company
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The World's Best Book on Motor Car Electric Systems

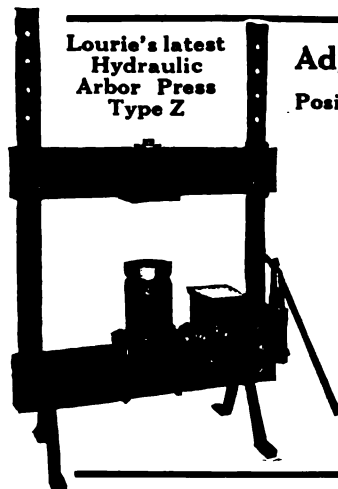
Electric Testing, Elementary Electricity, The Gas Engine from an Ignition Point of View and Driving the Car. 1919 Edition now ready. Special sections covering Packard, Dodge, Hupp and Maxwell Systems. Over 525 circuit and wiring diagrams up to date. 500 pages. Price \$2.50 Prepaid. Order to-day.

We also manufacture Electric Testing Instruments for Garages. Catalogue free.

H. E. PHILLIPS & CO.

(Formerly of Dayton, Ohio)

UNION CITY, IND.



Lourie's latest
Hydraulic
Arbor Press
Type Z

Adjustable Crosshead

Position quickly changed by
hydraulic pressure

No heavy lifting

For GARAGE

or

MACHINE SHOP

Lourie Mfg. Co.

Springfield, Ill.

Offset Speed UNIVERSAL WRENCH

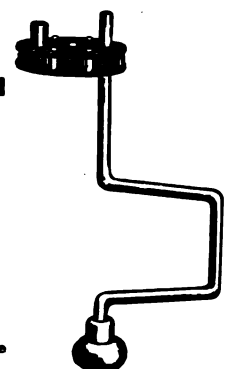
Immense Relief for Ford owners. How to get at that fourth connecting rod nut, has been a real riddle for years.

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The Garage *and* Shop Market Place

CYLINDERS

GROUND BY

SUNDERLAND'S

give satisfaction

MAGNALITE or CAST IRON PISTONS

SPECIAL PRICES ON FORD JOBS

REGRINDING NEW PISTONS

SUNDERLAND MACHINE SHOPS

OMAHA, NEB.

LOWEST PRICES

on Good Serviceable

PARTS

for all cars.

We are the biggest wreckers in the world. The size of our business enables us to undersell all competition.

Money cheerfully refunded if you are not satisfied.

We make a specialty of our service to the trade and can supply you with practically any parts you want from stock. Orders shipped the day received. Our stock includes motors, Bosch magnetos, coils, magneto parts, rear axles complete with wheels, differentials, tires, rims, and all other parts.

Correspondence from the trade invited.

WARSHAWSKY & CO.

Largest Car Wreckers in the World
1915 So. State St. CHICAGO, ILL.

SAVE ON ALL AUTO PARTS

the greatest stock in the Middle West. parts of all standard makes. Quick-service. Great volume makes it possible to sell to you for—

10 to 75% Less

in NEW PARTS would cost. Only the best parts sold and backed by an iron-guarantee.

Our Guarantee: Absolute satisfaction or money cheerfully refunded. For instant service on parts, write, phone or wire—

Auto Wrecking

"We Tear 'Em Up
and Sell the Pieces"

10th and Oak Kansas City, Mo.

STANDARD AUTO SALVAGE CO.

Successors to

MAXWELL BROS.

AUTOMOBILE PARTS and SUPPLIES

Attractive Prices
Prompt Service
Satisfaction Guaranteed

TRY US

3931-33 Olive Street, ST. LOUIS, MO.

CYLINDERS REGROUND

We have the best equipped shop in the Northwest. Our expert mechanics and highest grade equipment are your guarantee of a superior job. Over 800 Piston Patterns in stock.

GEAR CUTTING

Spur, internal, bevel, etc.

WE ALSO "CAPITOL" MARINE
BUILD MOTOR

Special prices to the trade
Write us today

AUTO ENGINE WORKS

ST. PAUL, MINN.

PLATINUM MAGNETO POINTS BOUGHT

HIGHEST CASH PRICE

PAID for Platinum. Discarded old gold Jewelry, Crowns, Bridges, Silver and Diamonds. Cash by return mail. Packages held 4 to 12 days for your approval of our offer, and returned at our expense if our offer is refused.

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Smelters and Refiners

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A NEW START with a real future

The automobile field offers better opportunities than any other to discharged soldiers and sailors. Big demand for trained men in this industry, and wages are good.

The Greer College of Motoring will make you expert in any branch of the automobile business. Jobs for graduates without extra charge.

Write today for free booklet

Greer College of Motoring

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Gas Engines and Air Compressor

BARGAINS

3-50 H. P. Mogul Gas Engines made by Int. Har. Co. Kerosene, gasoline or distillate fuel.

Guaranteed to be in first-class condition.

Also 1 Small 6x8, single stage Air Compressor.

Prices and terms on application.

THE LIVE POULTRY TRANSIT COMPANY
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Standardized Prices

Material and
Workmanship Guaranteed

Modern Equipment

Skilled Mechanics

Cylinder Regrinding

Standard and Oversize

Pistons -- Piston Rings -- Piston Pins

ALL WORK INSPECTED

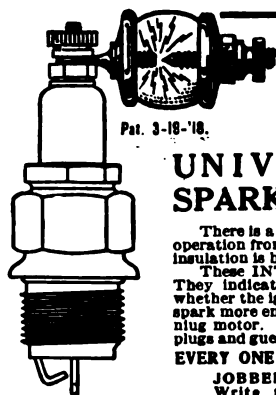
Established 1897 **Butler Manufacturing Company**
INDIANAPOLIS, IND.

With our

Bu-Nite Pistons

goes a

GUARANTEE
of SATISFACTION



Pat. 3-18-'18.

Spark Plug Troubles Are Rare Occurrences

on the car equipped with

UNIVERSAL or MARVEL SPARK PLUG INTENSIFIERS

There is a big demand for a device that insures satisfactory operation from spark plugs which are worn out or on which the insulation is broken; or a plug fouled with grease or carbon.

These INTENSIFIERS will make such plugs fire perfectly. They indicate instantly whether a cylinder is missing and whether the ignition system is in perfect order. They give the spark more energy—producing more power and a smooth running motor. They eliminate carbon, waste of gas, cleaning the plugs and guessing which cylinder is missing.

EVERY ONE OF YOUR CUSTOMERS WILL WANT THEM

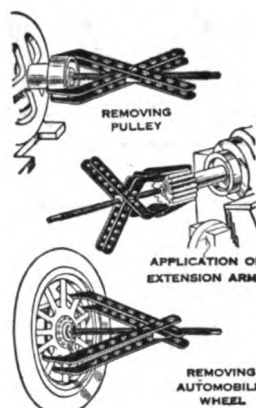
JOBBER and DEALER—Your profit is liberal.

Write today for our attractive proposition.

UNIVERSAL MFG. & SALES CO.

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Sawyer Sales Co., 50 Terminal Bldg., Lincoln, Neb.

Index to Advertisements

| A | | K | |
|-------------------------------|----------|-------------------------------|-----------|
| Advance Automobile Access- | | Kennedy Car Liner & Bag Co. | 77 |
| ries Corp. | — | | |
| American Bolt & Screw Case | 72 | | |
| Co. | 72 | | |
| American Machine Products Co. | 71 | | |
| American Technical Society | 69 | | |
| Atlas Auto Supply Co. | 8 | | |
| Auto Compressor Co. | 41 | | |
| Auto Engine Works | 74 | | |
| Auto Wrecking Co. | 74 | | |
| Automatic Safety Tire Valve | | | |
| Corp. | 63 | | |
| B | | L | |
| Bailey-Drake Co., Inc. | 37 | Lawrence & Co., L. | — |
| Baird Equipment Co. | 72 | Live Poultry Transit Co. | 74 |
| Beck & Corblitt Iron Co. | 75 | Louise Mfg. Co. | 73 |
| Bens Big Tire Shop | — | | |
| Bermo Co., A. G. | 66 | | |
| Boe Co., H. M. | — | | |
| Brunner Mfg. Co. | 57 | | |
| Butler Mfg. Co. | 74 | | |
| Burgess Mfg. Co., W. S. | 77 | | |
| C | | M | |
| Calculagraph Co. | 70 | McDaniel Rubber Co., Leo | 72 |
| Casco Manufacturing Co. | — | Marvel Carburetor Co. | 67 |
| Inside Front Cover | — | Marvel Machinery Co. | 45 |
| Casey-Hudson Co. | — | Meixell Co. | 3 |
| Cassidy Co., Edward A. | — | Mill City Co. | 39 |
| Catelain, Andre G. | 75 | Miller Rubber Co. | 75 |
| Champion Pneumatic Machin- | | Monarch Machine Tool Co. | — |
| ery Co. | — | Mutual Truck Co. | 43 |
| Inside Back Cover | — | | |
| Chicago Solder Co. | 71 | | |
| Coffield Tire Protector Co. | 33 | | |
| Curtis Pneumatic Machinery | | | |
| Co. | 35 | | |
| D | | N | |
| Dellafeld Co., Jos. | 74 | National Cash Register Co. | 59 |
| Denby Motor Truck Co. | 7 | National Rubber Filler Co. | 69 |
| Dunton Co., The M. W. | 70 | National Wire Wheel Works | 51 |
| E | | New Era Spring and Specialty | 66 |
| Ever-Tight Piston Ring Co. | 5 | Co. | — |
| F | | New York Coil Co. | 75 |
| Fairbanks Company | — | No-Leak-O Piston Ring Co. | 75 |
| Famous Tires Corp. | 75 | Norma Company of America, | 6 |
| Federal Electric Co. | — | The | — |
| Flexlume Sign Co. | — | | |
| Back Cover | — | | |
| Foster Bros. Mfg. Co. | 66 | | |
| G | | O | |
| Ganschow Co., William | 68 | Owens, Frank Chas. | 75 |
| Garden City Spring Works | 77 | | |
| General Utility Co. | 4 and 49 | | |
| Globe Mfg. Co. | 61 | | |
| Graham Roller Bearing Co. | — | | |
| The | 72 | | |
| Gray-Heath Co. | — | | |
| Greer College of Motoring | 74 | | |
| H | | P | |
| Halladay Co., L. P. | — | Paro, H. G., Co. | 68 |
| Haney & Co., J. H. | 65 | Phillips, H. E. & Co. | 73 |
| Harvey Spring & Forging Co. | 55 | Pondelick Bros. | 68 |
| Haywood Tire & Equipment | — | Premier Electric Co. | 75 |
| Co. | 72 | | |
| Heiser Special Tool Co. | 78 | | |
| Hinckley Machine Works | — | | |
| Hobart Bros. | 72 | | |
| Holmes & Bros., Inc., Robert | 73 | | |
| Howell Co., The W. H. | 73 | | |
| I | | R | |
| Inland Machine Works | — | Reliance Co. | 71 |
| J | | Romort Mfg. Co. | 67 |
| Jackson Compressor Co. | 63 | | |
| Jenkins Vulcan Spring Co. | 70 | | |
| Jewel Electrical Instrument | — | | |
| Co. | — | | |
| | | S | |
| | | St. Paul Auto Cylinder Grind- | 75 |
| | | ing Co. | — |
| | | Sawyer Sales Co. | 73 |
| | | Schrader's Son, Inc., A. | 70 |
| | | Shaler Co., C. A. | — |
| | | Front Cover | — |
| | | Standard Auto Salvage Co. | 74 |
| | | States Chemical Co. | — |
| | | Stenman Electric Valve Grind- | 35 |
| | | er Co. | — |
| | | Storm Mfg. Co. | 53 |
| | | Sunderland Machinery & Sup- | 74 |
| | | ply Co. | — |
| | | T | |
| | | Thompson Tire & Rubber Co. | — |
| | | Times Square Auto Supply Co. | — |
| | | Trexler Co. | — |
| | | Triangle Rubber Co. | 37 |
| | | Trione Piston Ring Co. | 65 |
| | | Tubular Woven Fabric Co. | — |
| | | Tungsten Mfg. Co. | — |
| | | U | |
| | | Universal Battery Co. | — |
| | | Universal Mfg. & Sales Co. | 75 |
| | | U. S. Air Compressor Co. | 47 |
| | | Utilities Sales Corp. | 4 and 49 |
| | | V | |
| | | Vanderpool Vulcanizing Co. | 72 |
| | | W | |
| | | Wagner Specialty Co. | 75 |
| | | Warshawsky & Co. | 74 |
| | | Waxit Mfg. Co. | — |
| | | Webber & Co., P. H. | 68 |
| | | Weston Electrical Instrument | 73 |
| | | Co. | — |
| | | Wood & Safford Machine Wks. | — |
| | | Zinke Co. | 67 and 77 |

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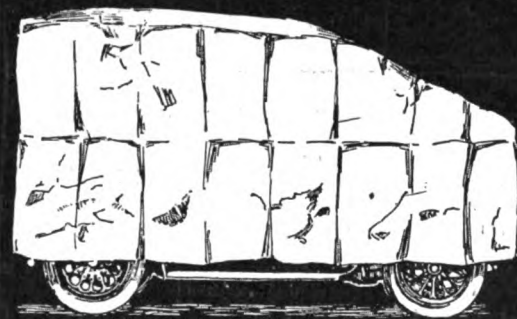
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Silvr Lined
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of One Tire

BEFORE and AFTER
being repaired and retreaded on
a silvr-lined mold.



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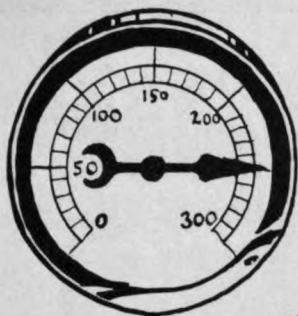
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LINED
RETREAD
MOLD**



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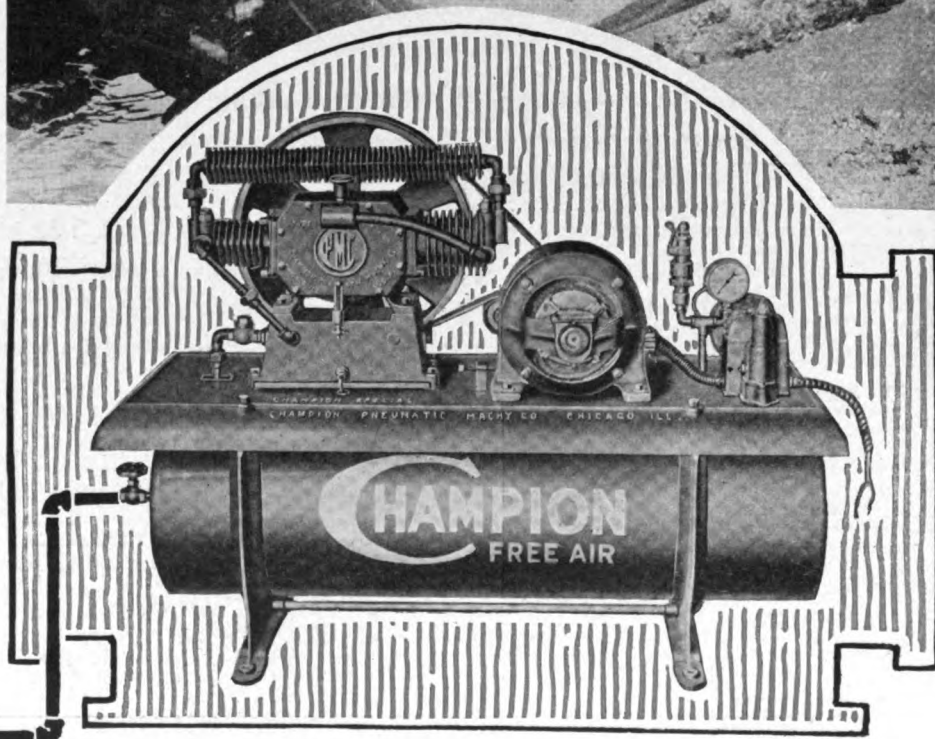
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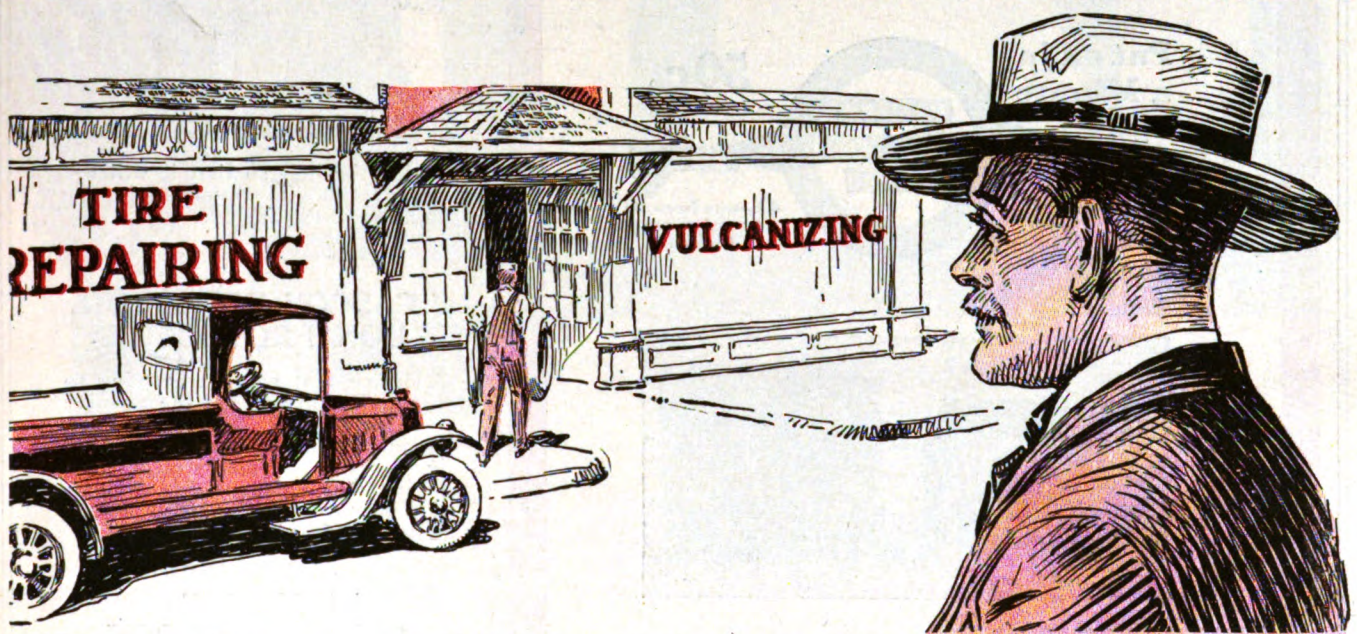
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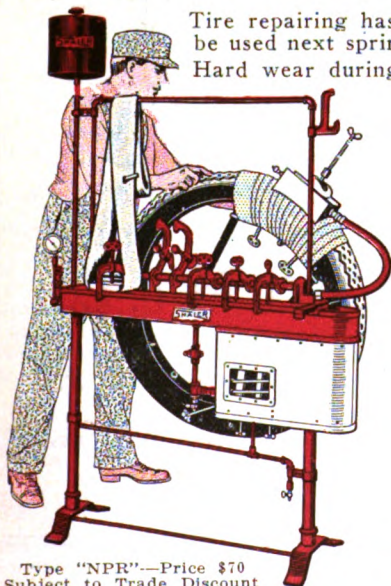
Published Monthly
116 So. Michigan Ave.
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DECEMBER 1919

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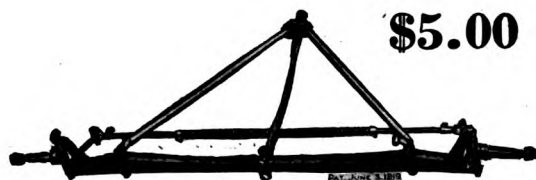
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Type "NPR"—Price \$70
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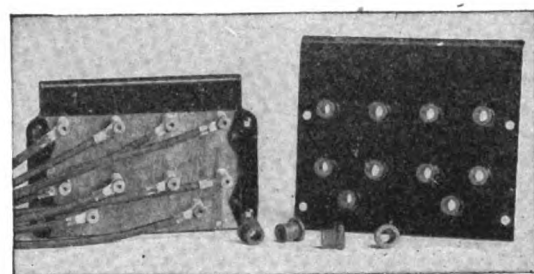
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a Minute**



50c.



DEALERS

"Casco" Specialties are big sellers among Ford owners. Write for particulars and trade prices.

"Casco" Products are handled by all Chicago Jobbers.

"HOLD 'EM IN THE ROAD"

Combines four valuable attachments—Radius Rod Brace, Anti-Rattler, Axle Support and Steering Device, all in one—Knocks Kinks out of the axle, radius rod, wheel bearing, rattle. Knocks danger and kinks out of driver. Sells for \$5.00.

"CASCO" FAN BELT GUIDE

Holds the belt so that it will not cut or run off. Attached in one minute. Sells for 50c.

"CASCO" FORD COIL BOX PROTECTOR

A device that many are trying to copy. Be sure to get the genuine "Casco." Over 200,000 in use. Handled and endorsed by jobbers in 48 states. Protects coils from injury and dampness.

Without Rubber, \$1.00.
Rubber Insulated, \$1.50.

"CASCO" OIL DRAIN COCK

The automatic, spring steel, ball seat, oil drain cock. In a class of its own. No cock-wrench—no "get under"—no loss—no leak—no worry. Pull the hook—see oil in engine. Sells for \$1.50 per pair complete.

Those who offer for sale infringements are liable as manufacturers of infringements.

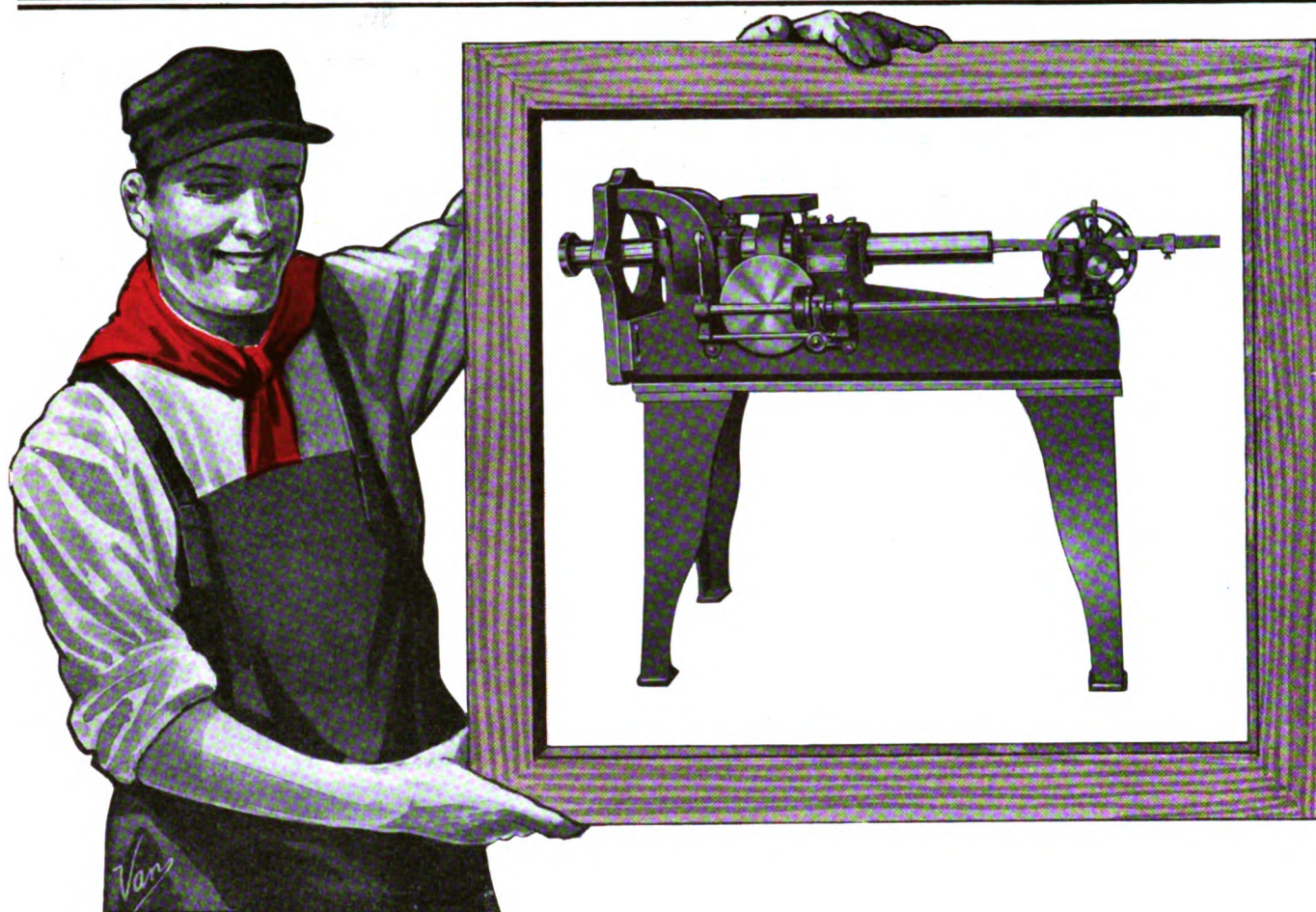
CASCO MFG. CO.

Manufacturers

Thomasville, Ga., U. S. A.

EXPORTER
Chas. F. Lyngsaa
46 W. Broadway
New York City
Latin and Mexican

EXPORTERS
Muller, MacLean & Co.
11 Broadway
New York City
English



A Picture of Business Health

You'll never need a doctor for your business if you have a Marvel No. 5 in your shop. It is always in shape—is spick and span—ready for work. It always does a high-class job and is the greatest little money maker you ever saw. It works faster and does better work at less cost than any machine ever invented and handles any gas engine cylinder from a **motorcycle to a tractor**.

Marvel Cylinder Re-Boring Machine No. 5

in your shop will double your man-power—will turn wasted time into profitable hours—will establish you in the Re-boring business and show a profit on your books.

The Marvel No. 5 is power-driven—automatic—accurate and speedy. It has been endorsed by hundreds of schools and colleges and automotive repairmen.

GET THIS PROFIT

There's a lot of extra money floating around in your community and you can get it with a Marvel No. 5. Think of the hundreds of owners of motor cars, trucks and tractors whose cylinders need re-boring. Cash in on it. Get in shape to re-bore them on a Marvel No. 5 and fit them with Marco Oversize Pistons.

WRITE US TODAY

We will outline our entire proposition. We will tell you what a Marvel No. 5 will do for you—Will show you the profit you can expect. We will explain how, through our Co-operative Business Building Advertising, we help bring customers to your shop and how the Marvel No. 5 will hold them.



The Sign of a Perfect Piston

MARVEL MACHINERY COMPANY

510 Loan and Trust Building

MINNEAPOLIS, MINN.



The Sign of a Perfect Piston

"NORMA" PRECISION BALL BEARINGS

(PATENTED)



The "factor of safety" of a car, truck, tractor or power boat is no higher than the factor of safety of the weakest part entering into its construction. Which indicates the necessity for a fine balance of quality throughout, and emphasizes the fact that there is no "minor part" in an automotive unit.

The proved service capacity of "**NORMA**" equipped magnetos and lighting generators—their high factor of safety to which the "**NORMA**" factor of safety contributes bearing dependability—have made them to be the accepted standards with builders who place serviceability before all else.

Be SURE. See that your electrical apparatus is "**NORMA**" equipped.

THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

Ball, Roller, Thrust and Combination Bearings



American Garage & Auto Dealer

Published Monthly

TABLE OF CONTENTS

EDITORIALS

| | |
|------------------------------------|----|
| The Influence of Productivity..... | 9 |
| Why the Shows?..... | 9 |
| Machinery and Farm Products..... | 9 |
| Good Roads | 11 |

GENERAL

| | |
|--|-------|
| "Your Town" Has the Opportunity, by Arthur S. Ballard | 12-13 |
| Ain't That Just Like a Boss fer You, by Frank Farrington | 13-14 |
| The Law on Purchase of "Good Will", by Chelsea C. Sherlock | 15 |
| Merchants Must Know Real Profits, by Nalter Engard | 16-17 |
| Perils from Improper Storage of Oils, by Charles E. Pask | 18-19 |
| Accounting, by J. Newton Boddy..... | 20-21 |
| Cold Chisel—How to Make and Use It, by J. N. Bagley | 22-23 |
| Law and the Automotive Industry, by R. R. Rossing | 24 |
| Giving the Tourist Road Information, by C. M. Adams | 28 |
| "Keeping the Automobiles Sold," by C. L. Funnell.. | 37 |
| Window Display Attracts Attention, by Felix J. Kock | 38 |

DEPARTMENTS

| | |
|---|-------|
| Practical Hints for Shop Mechanics, by E. C. Pohlmann | 26-27 |
| Welding, Cutting, and Brazing Practice, by David Baxter | 29-30 |
| Readers' Questions and Answers, by E. C. Pohlmann | 31-34 |
| How to Make the Shop Profitable, by E. B. Hinrichsen | 35 |
| Facts and Ideas for the Tire Dealer..... | 46 |
| From the Truck and Trailer Field..... | 48 |
| Farm Automotive Equipment News..... | 50-52 |
| Accessories | 54-56 |
| Garage Equipment for Better Efficiency..... | 58-60 |
| News of Manufacturers and Jobbers..... | 62-66 |

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S. R. EDWARDS, *Editor*.
E. C. POHLMANN, *Assistant Editor*.
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OVER-LAND GUIDES

hold Fords in perfect control

You all know what it is to drive a Ford equipped only with its standard steering equipment. The slightest irregularities in the road cause the front wheels to wobble and swerve—keeping a constant strain on the driver and subjecting the steering mechanism and tires to a constant wear and tear.

There is also the ever present danger when making a short turn that the steering connecting rod will go over center travel, resulting in the loss of control which means the danger of serious accident and the possible destruction of the car and the lives of the occupants.

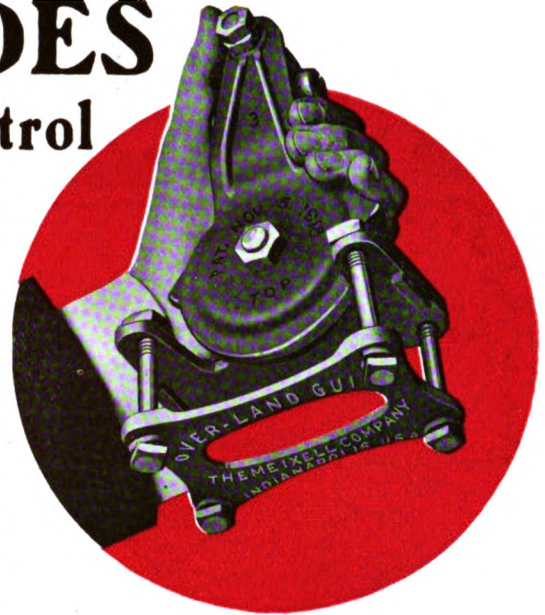
The Over-Land Guide has made these troubles a thing of the past for thousands of Ford users. This Guide gives the driver better control over the Ford than he would have over a high priced car.

IT IS LIFE INSURANCE FOR FORDS AND FORD OWNERS. It saves the energy and nerves of the driver, and eliminates the strain (due to faulty control) on the steering mechanism and wear on the tires.

When a Ford is equipped with an Over-Land Guide the driver can handle the wheel with the tips of his fingers while the car is in motion over the roughest roads, without danger of losing control.

IT REDUCES BREAKAGE AND REPAIRS OF THE FOLLOWING PARTS, such as spindle connecting rod (or tie rod). Spindle body arms and bushings. Spindle body and bushings. Ball and roller bearings and hub. Steering connecting rod and ball joints. Steering gear ball arm. Steering post bracket, bushing and bolts. Steering post, steering gear pinion. Steering gear drive pinions. Steering gear internal gear case and bushings.

DEALERS—Can you sell a device that saves at least ten times its cost in one year on the Ford car or truck? The OVER-LAND GUIDE is sold on a money-back guarantee. Write or wire immediately for complete information.

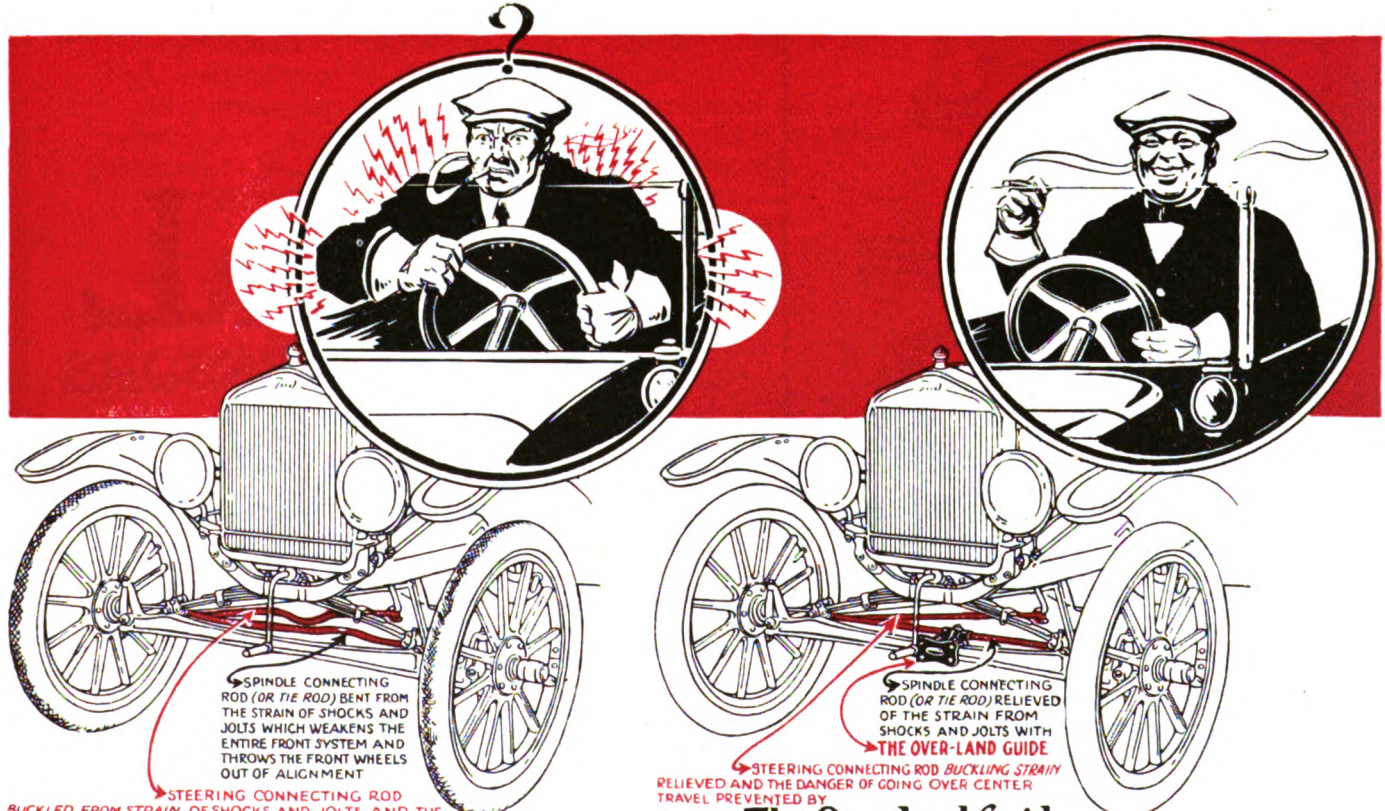


The OVER-LAND GUIDE bolts to the center of the front axle and the center of the spindle connecting rod (or tie rod) securely, relieving the vibration and strain in the spindle connecting rod (or tie rod) and entire front system, and the steering mechanism up to the steering wheel.

THE MEIXELL COMPANY

Office---216 Board of Trade Building, INDIANAPOLIS, IND.

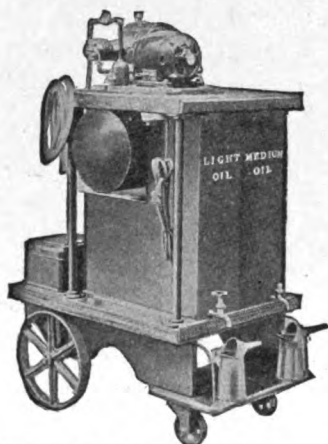
The Automobile Sundries Company, Exporters, 16 Broadway, New York, N. Y., are the sole foreign distributors for the Over-Land Guide



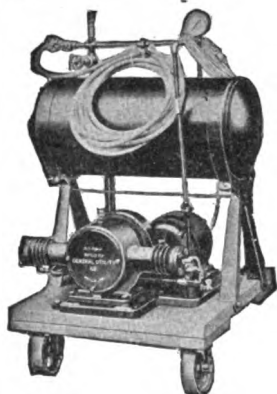
A Ford Controlling Itself

The Over-land Guide
PATENTED
Controlling the Ford

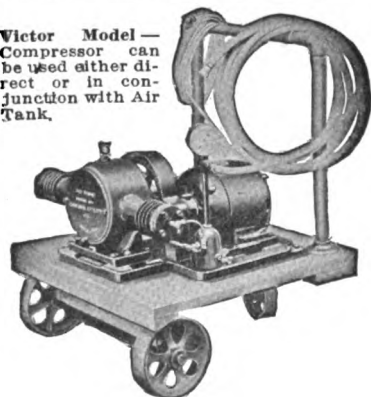
FREE AIR



Utility Model—Combined air compressor, air tank and oil service. It makes your air service a direct profit maker by reminding the motorist of his need of oil.



Direct Portable Model—Pumps cool air direct into tire. Consists of compressor with direct drive $\frac{1}{2}$ H.P., ball bearing equipped motor on portable truck.



Victor Model—Compressor can be used either direct or in conjunction with Air Tank.

What Do You Get Out of this Sign?

Your "Free Air" sign is meant to bring you business. For to give you maximum returns, it must be backed up by an efficient service. And by a service that does not eat up its money-making value, in current and maintenance cost.

The **General** line of our compressors give you just what you need to get—real results out of your "Free Air" service: An outfit that will exactly suit your needs; a highly efficient compressor that delivers 5000 cu. in. of air per minute, at an unusually low current cost, and an equipment, including a $\frac{1}{2}$ h.p. GE ball bearing equipped, direct connected motor, that will give long trouble-free service, costing you little enough for upkeep.

Two Cylinder GENERAL AIR COMPRESSORS

Write for our booklet, "The Low Cost of Cool Air," and get acquainted with our line.

We sell through exclusive Distributors only. Immediate deliveries.

UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

Factory 1324 Ogden St. Philadelphia—Office 809 New Stock Exchange Bldg., Philadelphia

Utilities that Sell Because They Serve

ZELNICKER *Ever-Tyte* The Piston Ring for All Engines

Performance—Guaranteed!

Install *ZELNICKER Ever Tyte* Piston Rings in Autos, Trucks, Motorcycles, on Gas, Oil or Steam Engines, Air and Ammonia Compressors and Refrigerating Machines. On Pumps, Fire Engines, Steamships, Aeroplanes. In any engine cylinder up to 36-inch diameter—and their performance is guaranteed!

For they are made on sound mechanical principles that are unfailing.

Six Point Circular Expansion and Zelnicker's Patented Right Angle Interlock construction insure perfect combustion and maximum compression; besides, they give maximum power efficiency on less fuel and oil.

They will do all claimed for them. The broad earnest guarantee reproduced here removes all doubt. They are giving satisfaction to unnumbered thousands—daily.

Every live dealer and repairman cannot overestimate the significance of this nation-wide advertising campaign. Here is a list of publications that will carry *ZELNICKER Ever Tyte* Piston Ring ads.

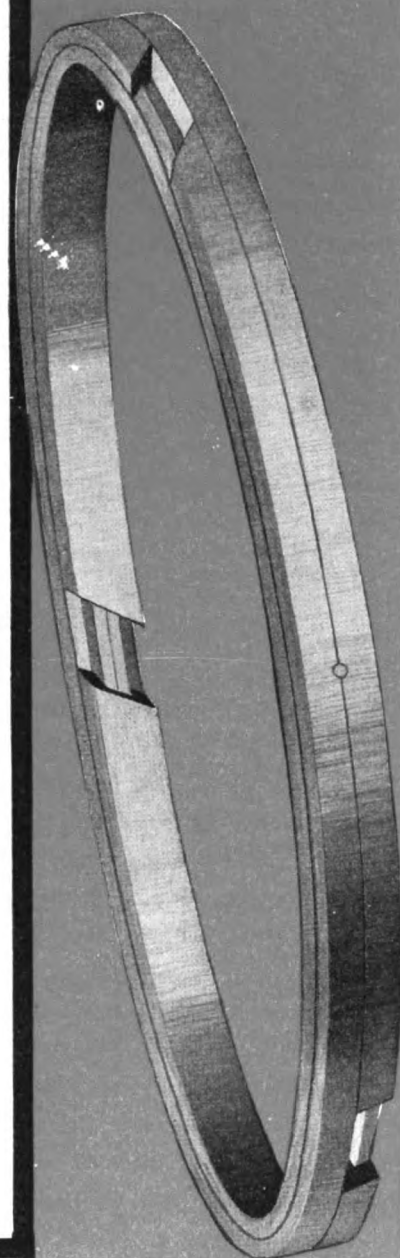
Saturday Evening Post
Literary Digest
Progressive Farmer

Successful Farming
Country Gentleman
Sunset Magazine

They aggregate over 17,579,284 readers. The demand for Piston Rings will be overwhelming. Live dealers will order early.

Satisfied customers and bigger profits for you. Write for our proposition.

THE EVER TIGHT PISTON RING CO.
Saint Louis, Mo.



Read

The Guaranty Bond



GUARANTY BOND

We guarantee *ZELNICKER Ever Tyte* Piston Rings to produce higher compression, develop more power, and use less fuel and lubricating oil, you to be the sole judge.

We will refund the full purchase price to any purchaser upon the return of the rings if they fail to give absolute satisfaction within a period of twelve months from date of installation.

THE EVER TIGHT PISTON RING CO. ST. LOUIS

No. 2,628,243

M. Zelnicker
PRES

If it's rubber— TIRE-DOH will mend it!

Just because TIRE-DOH is known to be the best tire-repair outfit on the market for mending tubes and casings, does not mean its usefulness ends there.

You will render a good service to your customers and to yourself when you sell them TIRE-DOH if you will mention that it can also be used for repairing leaks, holes, tears and cuts in rubber boots, hot water bottles, hose, raincoats, rubber coverings, gloves — *anything* which is *rubber* that needs mending.



The Genuine TIRE-DOH Outfit consists of One Can TIRE-DOH and One Can TIRE-DOH Cement. Two sizes—50c and \$1.00. TIRE-DOH repairs anything that is Rubber

For insulation jobs it is very useful and dependable.

There is nothing which will give so much satisfaction to your customers — simply because of its all around usefulness. And because of this you are assured of a "good repeat business."

Arrangements should be immediately made so that you can handle TIRE-DOH for your territory in 1920.

WRITE

Atlas Auto Supply Co.

680 W. Austin Ave.

CHICAGO

ILLINOIS



American Garage & Auto Dealer

Comprising AMERICAN GARAGE AND AUTO DEALER, AMERICAN GARAGE MAGAZINE,
GARAGE EFFICIENCY and RETAIL MOTOR TRADE JOURNAL.

Vol. X. No. 12

CHICAGO

December, 1919

The Influence of Productivity.

About the time the coal strike ended, the newspapers carried two interesting dispatches. The first was brief but to the point. It stated that former president William H. Taft had declared that danger of bolshevism is past in America, "because the leaders of dissatisfaction have found that they could not turn this country into a bolshevik government."

In an interview on December 11, Secretary of Labor Wilson stated that strikes and lockouts are rapidly decreasing in number. "The national industrial situation, from the standpoint of increased production," said Mr. Wilson, "seems to bear a better aspect than at any time since the period of unrest began more than a year ago with the signing of the armistice."

"It seems likely that within a week or ten days, more men will be at their accustomed daily tasks than at any time within many months. With the mines again turning out the normal fuel supply, factories can run full time and production will be largely increased. This will tend to reduce costs of necessities, as President Wilson has pointed out."

This matter of production has in recent months been emphasized again and again by economists and leaders of industry. Herbert Hoover in a recent address outlined the tremendous importance of production in world affairs. The improved conditions in

Europe after the French Revolution resulted from the introduction of the steam engine which enabled greater production with the same amount of labor and also permitted a rise in the standards of living. The existing situation in Europe can be improved by the same remedy—greater production.

It was greater production per capita that enabled this country to grow away so rapidly from Europe in the 145 years since its inception. Of course, it has been easier to raise crops over here and we have utilized many epoch-making and labor-saving inventions. In fact, this has been termed the "age of machinery" and we only see the beginning of the use of the automobile in assisting in all lines of productivity of the country.

Why the Shows?

Beginning next month, automobile shows, both passenger car and truck, will be held in various cities throughout the country—and they will attract large attendances, not only from the public, but from among the automotive dealers and garagemen as well.

Present indications are that these shows will be greater in every way than those of any preceding year. Displays of passenger cars, motor trucks, and accessories for the New York and Chicago shows are to be most comprehensive in number and attractiveness. Undoubtedly the shows

in other cities will likewise establish new records as to exhibits and value to the industry.

If automotive dealers cannot attend the larger shows in New York or Chicago, the smaller shows in the cities nearest them will be well worth attending.

"Keeping up-to-date" is no easy task for the average individual, but the automotive dealer must be a little ahead of being up-to-date. That is quite essential, for the automotive public is well informed through publicity channels, of development of all kinds relating to the industry. It is expected that men engaged in the industry are fully informed on the details of all new developments and the annual shows afford excellent opportunities to acquire this information with the least expenditure of time.

All in all, the shows are of great importance to the automotive dealer and garageman, both from the direct personal benefits received from viewing the exhibits and the public interest that is aroused.

Machinery and Farm Products.

It's said that "the early bird catches the worm"—and the truth of this saying has many times been demonstrated. The position which automotive dealers and garagemen of the smaller towns occupy in regard to the

Garages! Now for Repair Work.

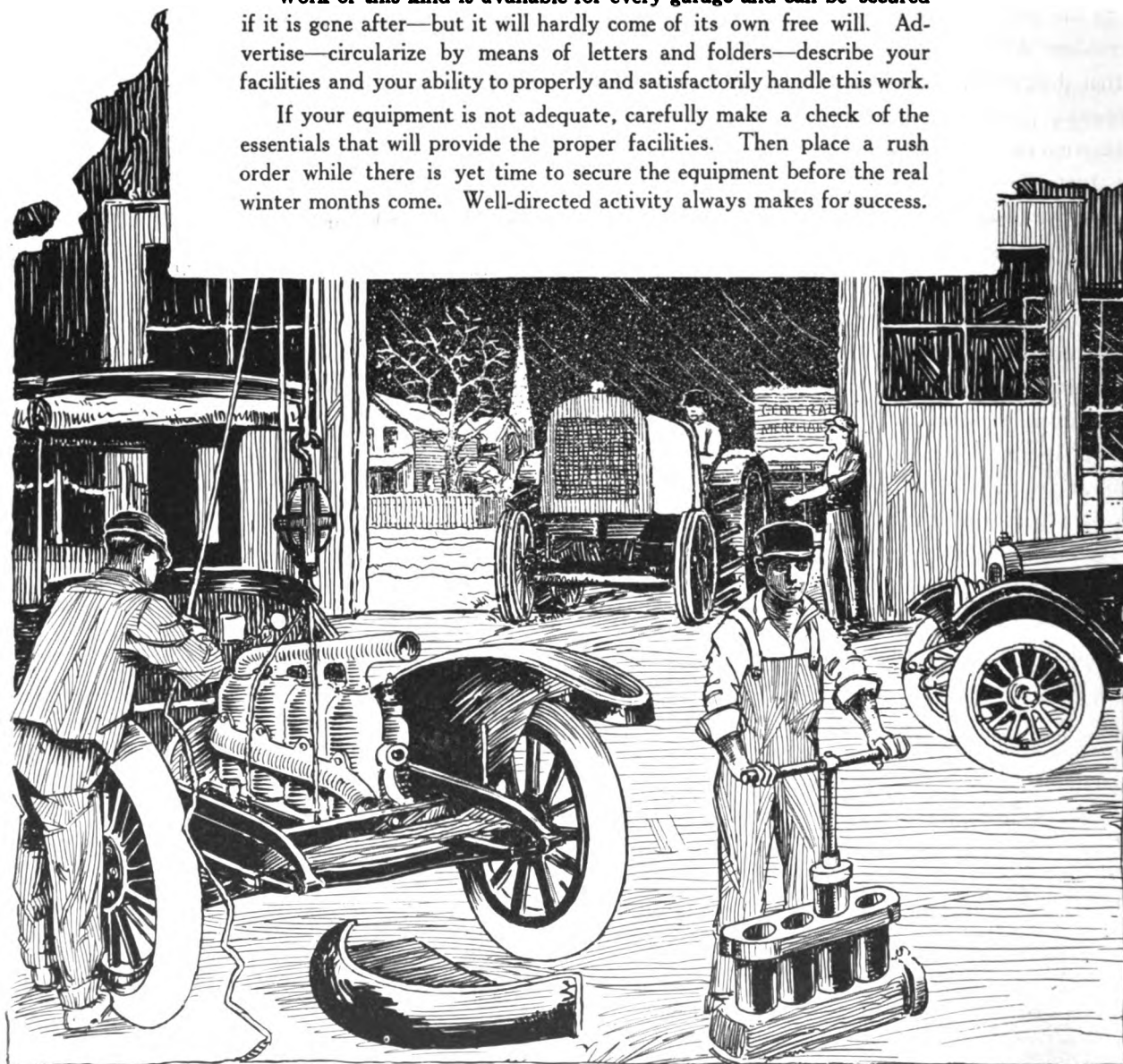
Snakes, bears and groundhogs hibernate in winter—they cease all activity. Man does not hibernate—but some industries do, owing to circumstances thought to be beyond control of man.

The automotive-garage business is not one that is forced to hibernate during any season, although many thought it necessary in the younger days of the industry. Now, however, there is much business which may be secured that will keep the garage organization intact during all seasons of the year, and particularly the winter months.

Don't hibernate! The winter season is the time when you should be preparing your customers' automotive equipment for the coming year. Now is the time to install that new lathe, drill press, emery wheel; those special tools for increasing your efficiency; the new battery charging outfit. Equip your garage to do reboring, overhauling—everything, in fact, to place and keep a car, truck, tractor, or farm-electric plant in good running and operating condition.

Work of this kind is available for every garage and can be secured if it is gone after—but it will hardly come of its own free will. Advertise—circularize by means of letters and folders—describe your facilities and your ability to properly and satisfactorily handle this work.

If your equipment is not adequate, carefully make a check of the essentials that will provide the proper facilities. Then place a rush order while there is yet time to secure the equipment before the real winter months come. Well-directed activity always makes for success.



future is much like that of the early bird.

The United States contains 1,900,000,000 acres of land of which 60 per cent is tillable. Of this 60 per cent, some 367,000,000 acres or 32 per cent was planted in crops in 1918. The possibility for development of agricultural territory is, therefore, great. For every 100 acres of land now under cultivation, 300 acres may be tilled when the country is fully settled. Naturally of the land now being tilled, only the best, convenient to large cities and easily brought under cultivation, is in use, and of this land it has been estimated that possibly 85 per cent is not yielding full returns.

"Extension of the farming area," says Secretary of Agriculture David F. Houston, "will consequently be made with greater expense for clearing, preparation, drainage, and irrigation, and for profitable operation will involve marketing arrangements of a high degree of perfection."

During the last few years the farmer has been receiving high prices for his products, and he has prospered. He quite naturally will not want to sell his products for a lesser price than he has been getting. On the other hand, the consumer will not continue to pay the high prices. Only this month, President Wilson was reported to express the belief that the high cost of living would show a distinct downward trend within the next 60 days.

The farmer can only do so much work with his equipment—of the kind used for some years. The work which he is able to do in a day now, as compared with that done in a day prior to the Civil War is considerably greater. It is due entirely to the use of machinery, and labor-saving devices.

The introduction of the automobile

provided the farmer with a machine having great labor-saving possibilities—and his successful use of it has encouraged him to adopt equipment operated by the same kind of a power plant as his automobile. The tractor is an acknowledged success on the farm, and is rapidly becoming a part of the standard equipment of every successfully-managed farm. Then there is the farm-electric plant which furnishes power for operating equipment that formerly was manually-operated or run by horse power.

The use of modern power-driven farm machinery will enable a farmer to do more work in a given time than he did formerly. He, therefore, will be able to bring more land under cultivation and raise larger crops. While the unit value of these crops will be less than the farmer is receiving in these times of high prices, his total income will not be decreased; in fact it will be materially increased for he can cultivate more intensively his land, and raise maximum crops on it instead of the smaller crops which it is estimated 85 per cent of the tilled land is producing.

The automotive dealer and garageman being the experts on gasoline-engine equipment in the towns to which the farmer looks for his immediate needs, as regards equipment and repairs, occupy excellent positions for securing and developing a business that will be stable and yield good returns—increasing returns as the farmer adopts more and more power-driven equipment. "It's the early bird that catches the worm."

Good Roads.

In these days of coal shortages and lack of railroad facilities, much is heard of the possibilities of motor-truck transportation, especially for the shorter distances. It is declared that the railroads are not efficient for the so-called short-haul freight traffic,

and the arguments presented are most logical and convincing.

For successful motor-truck transportation, there must be good roads. The Federal Aid Road Act approved shortly before this country entered the war, and since amended, has resulted in legislation for more satisfactory central highway agencies in many states, and a systematic planning of road systems throughout the country. In practically every state at the present time, there is a highway authority with requisite power and with adequate funds to meet the requirements of the Federal measure.

There are only three limitations placed by the Federal Aid Road Act on the type of road to be constructed. They are that the road must be substantial in character; it must be a "public road," a major portion of which is now used, or can be used, or forms a connecting link not to exceed ten miles in length of any road or roads now or hereafter used for the transportation of the United States mails; and the amount contributed from the Federal treasury for its construction must not exceed 50 per cent of the cost, or in any event \$20,000 a mile. Thus but few important roads will be debarred from receiving federal aid under this act.

With these provisions for the building of an extensive system of roads, there is no reason why the use of motor trucks should not be greatly increased for hauling purposes, especially in the rural districts. The farmer is beginning to recognize the value of motor trucks in the operation of his farm, and he will be a strong advocate of roads of such construction as will enable motor trucks to be operated over them. With good roads the farmer will purchase more trucks and have fewer horses, so there will be more business for the local garageman.

"Your Town" Has the Opportunity

No Need to Go Away from Your Own Hometown to Find Success—"If a Man Build a Better Mousetrap Than Others Can Build, He Will Be Sought Even Though He Live in the Middle of a Forest"

By Arthur S. Ballard

Up in Maine there is a quaint old friend of mine who possesses a fund of knowledge about many things. He has been a merchant, farmer, mayor, teacher and writer. His personal library is one of the best in the state, for he is a lover of books.

I spent many summers in Maine and I always made it a point to call on him when I was there, for I enjoyed listening to his views on different subjects. I have since found that most of his opinions are mighty sound and they have helped me more than once. The other day I recalled some of our conversations and it occurred to me that they might prove mighty interesting to some garagemen and automotive dealers.

We were sitting in his library, when I remarked that it seemed strange to me that a man so fond of reading as himself, retired from business and well off as he was, did not travel and see more of the world. He smiled at my question. "Perhaps it does seem strange to you," he said, "but I'll tell you why I have never left the state.

"When I first started to make my own way, I found that most of the young fellows of my own age were leaving town to try to win fame and fortune in the big city. Even in those days I was quite fond of reading and everything that I had read pointed to the fact that opportunity was ever at hand, no matter where one was located. So I decided to stay here. I did. I found success.

"During my 45 years of hustling, I

met many men who were always looking towards far-off fields, and yearning for a change of location, or a change of business. Some felt that the business in which they were engaged was a poor one, or that the town was a poor one, or that there was no money to be made.

"I knew two fellows—I don't recall

folly and remained in their own towns, worked hard and made a success of their businesses.

"I never could understand why so many dealers in many lines were constantly looking far away for new fields when old Dame Opportunity was fairly clamoring at their door. And do you think that time has

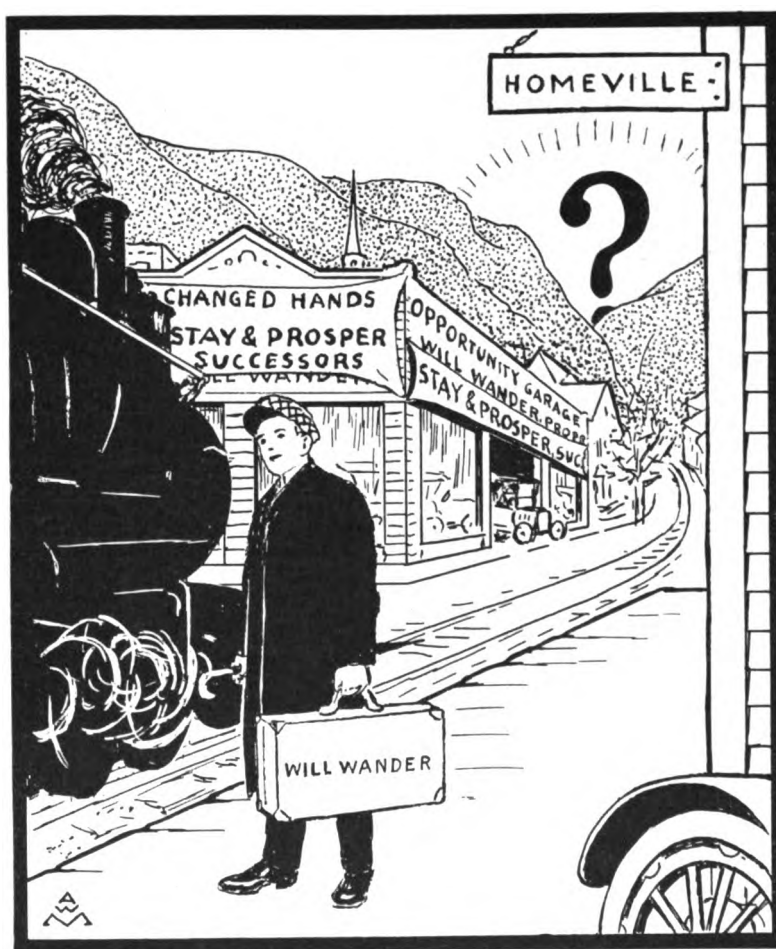
changed this? Things are not one whit different than they were in those days, because human nature is the same.

"The one big reason that so many merchants move is the fact that they have failed to grasp the numerous opportunities that are right at hand. Because they are not doing sufficient business, they feel that something is wrong with the line they are handling, or with the town in which they are located. To-day, retailing has become a science. If the dealers would follow some of the proven successful methods, success would be bound to come.

"Look at Frank Schofield—you've seen his garage downtown. There's a young fellow that has proven this to be true! Frank was born right here and worked here all his life.

But Frank possessed foresight. With the coming of the automobile, Frank saw that it would some day become a necessity in the town and the country. He saved his money and worked hard. And when he was just twenty-one, he opened his garage. By that time cars were getting plentiful in this neck of the woods.

"He didn't sit back and wait for business to come in to him. He



"A Rolling Stone Gathers No Moss," for Opportunities Are Neglected.

their names, so we will call them Smith and Jones—who both owned what were called 'general stores'; Jones' store was in Bangor and Smith's in Lewiston. Smith said that he thought that he could do better in Bangor and Jones was sure that if he could locate in Lewiston, he could do better. I put them in touch with each other and the outcome was that they both realized their

went out and got it. He learned the number of cars in the territory and who the owners were. He was responsible for the organization of the Motor Club, and in that way not only boosted the game, but he came in personal contact with most of the car owners.

"He advertised. He bought wisely. He kept a step ahead of the ever-increasing business, by constantly expanding and equipping his garage to render better service. He was constantly going after new business, new ideas.

"When tractors came on the market, he was the first to introduce them in this territory. Lately he has taken on the agency for a farm-lighting plant, and he is making lots of farms more comfortable places for people to live on and more money for himself out of this enterprise.

"When Frank started his place, there were two other garages in the

town, but he got the large volume of the business because he used his head for something else than a hat rack. After he had established the business, the other fellows concluded that Frank was getting most of the business because he was born and raised in the town, and that there wasn't enough business in the town to support three garages.

"They left the town for new fields. Frank bought them out and promptly proved they were wrong in their belief that there was no more business to be had, for he more than doubled the volume that all three had been doing in a period of six months. Yes, sir, he is a mighty good example of what a man can be, no matter where he lives.

"If you consider the vast amount of the country's wealth that is in the agricultural territory and small towns, you will realize that never before were opportunities so great for

the retailers in small towns. Yet people are constantly looking away from the wealth that lies at their hand to the mirage in the distance.

"If a man has it in him, he can succeed wherever he may be located. If he can't get ahead in one place, he usually won't in another. Sometimes, of course, opportunity for development of his particular ability is lacking, and he finds it elsewhere.

"But to come back to your original question—you asked me why I didn't travel. This is why: This town bore me, nourished me, gave me success, happiness, my wife, my children, my grandchildren, my friends. I have watched it grow—I have learned to love it and the people in it. That is why I stay. My books take me all over the world, show me peoples, customs, countries. They carry me away into new lands, yet when I want to return to the peace and happiness of my home, I put the book down and here I am."

Ain't That Just Like a Boss fer You!

The Freckle-faced Garage Kid Writes to a Pal of His About the Boss and Others—"Last Friday, the Boss Said Fokes Like to Paytronize a Garaje Where the Forse Is Polite to 'Em—I Sed, How About the Boss?"

By Frank Farrington

Dear Pete:

I told you Ide rite to you diddent I? Wel when I say Ile rite, I rite. Ime that way. And when I get to be the pressident of a companny maiking a thousand automobeels a weke, youl get out my leters and there youl hav the life histry of me from boyhood and youl say you new him when he was just starting in on the pathway to faim. Aint that so?

This is sum garaje, buleve me. Its bigger than all three garajes in Pinkville. Its as big as Sime Plankners barn on his big stock farm. You want to cum over sum day and see it. And its full of cars all the time and they kepe me husseling you bet. Ime a general errand boy and I put air in tires and sell gas and call the boss and get the male and do prettie blaim nere everything noboddy else wants to do I guess.

I aint going to rite much in my letters about the boss. He mite find one and Ile say Ime going to rite just what I think and not waist my time riting bokays for fokes. I ain't kicking, understand. If I diddent like

this job I cood leve enny time. The boss is all rite, but what he dont kno about sum things wood maik a big book, but what he knoze about getting fokes to buy his cars and gas and things wood maik a bigger book yet.

Semes to me men running garajes have a good dele to say about what kind of fellers they want working for them and then they forget to say enny thing about what kind of a boss the fellers like.

My boss says he wants the feller who works in the offis to be nete all the time and not look like he just crawled out from under a sick flivver. Wel thats all rite. That soots me. Ime that way. But you ought to see the boss himself sum days. He sits around the offis with his hat on and the darndest looking hat you ever saw, just about the stile of a last yeres birds nest. And mebbly he changes his coller and mebbly he dont and sumtimes heze got a good start raizing whiskirs.

Now hows a boss that looks like a chepe mekannic going to maik his

offis boy think he ought to be slick all the time?

The boss gets the hole bunch together every Friday nite and gives us a leckcher or sumthing. Last Friday he sed he was going to talk to us about bein polite to fokes that cum in and then he yelled "Shut that dore and all of you cum in here and sit down!" Just like that. He diddent even say please shut the dore.

He sed that fokes like to patronize a garaje where the forse is polite to em. I sed how about the forse liking sumboddy to be polite to 'em? And he lookt at me as if hede bite my ere off.

Wel I ment it. Dont a offis boy or a mekannic or a showfer like to have the boss and the other fellers and the customers trete him rite? Ile say he does.

Now weve got one feller here that gets my gote. First place, he calls me willie. My name is William and I don't care if Ime called Bill or even Will, but willie! It maiks me fele like maiking a noise like a buz saw cutting a nale in 2.

Dont that gink kno you can maik a feller fele friendly by calling him sum name he likes and you can maik him mad by calling him sum name he dont like? Ime that way.

And then, besides calling me willie, youd think he was king of the garaje to see the way he orders me around. Of coarse I kno heze higher up than I am and heze got sum rite to tel me to do things, but he needent think heze bought me. He cant boss the rest of the forse so he taiks it out on me. Heze a kind of a book keeper and sailsmun and he dont work out in the shop enny so he thinks heze sumthing grate.

Theres Bob, heze the boss man in the place outside of the offis and heze different. Ide do ennything for Bob becaws heze friendly, but Persy, nixie! I suppose tho a feller who has to go around with the name Persy tackt onto him cant help being a nutt.

Buleve me Ime going to help put the skids under Persy. Nun of the other fellers likes him and Dazie hates the ground flore he walks on. Dazie is our stenografer &c. I herd the boss one Saturday nite when he was paying her off tel her she was a perl of grate price, so now I call her perl when noboddys around and she goze rite up in the air when I do it. Sheze afrade Ile give her away that sheze stuck on the boss.

If Dazie and me cant give Persy the run, its funny. Sheze always catching him maiking mistaiks and heze always trying to catch her maiking mistaiks and not doing it becaws sheze always rite there with the goods and Persy, he coodent sel a dollars worth of gas and taik in a dollar bil for it and get it rite and when he rites enny man's name on a tag it taiks 2 men to rede it.

Say theres sum differens in the way fellers rite on tags and things. Whats the use of riting on a tag a lot of things to be dun to a car and then not have ennyone be able to rede what you rote? Persy is always getting names pretty nere rite. Hele rite Peterson for Paterson, and Jameson for Johnson and such fule things. Yes sir, he pretty nere maid

old man Jamesen fourclose the mor-gij on the garaje becaws he sent me there with a bil just by riting Jame-son insted of Johnson. "Tel your boss if heze so anxious to settel Ile be down and settel with him tonite. Ile teeche him to send me a bil for stuf I aint had." Thats the way old man Jameson talkt to me. I thought



It's Poor Policy to Preach a Thing and Not Practice It.

the boss wood bust when I told him. Thats the time Persy pretty nere lost his job.

When I get to be a book keeper or ennything Ime going to rite names rite if I dont do ennything else. When I taik sumthing to the rong place Ime the feller that gets blaimed and I aint to blaim eether. Its my bizness to taik things to where theyer marked. If theyer marked rong thats sumboddy elses bizness agen. So the next time Persy maiks a brake Ime going to let her go thru and see whatll happen to mister Perse.

Now Ive ritten that, cum to think about it, I saw in a bizness paper the other day that if a garaje is going to be a sucksess, the hole bunch has got to work together and teem work is what counts. I suppose if I let sumthing go rong becaws Persy markt it rong we mite get in bad with a customer and looze his bizness. Ile have to taik it out of him sum other way than that. But buleve me Ime going to get him. When I maik up my mind to get even with a feller, I get even or bust, Ime that way. You kno me, Pete.

Yours til the gastank freezes

Bill.

Highway Transportation Bureau Announces Its Policies.

The transportation bureau of the Federal Highway Council, which has recently been established, has adopted the following policy to represent its aims and objects:

To assist in co-ordinating the highways with the other transportation agencies of the country; to encourage the development of highways that will advance the economic life of the nation; stimulate their use in such a manner as to facilitate and cheapen the transportation of food, raw materials and finished products, and to co-operate with government agencies, both state and national, to the end that our highways may be of maximum service in the transportation system of the country.

In announcing its platform, the aim of the transportation bureau will be to seek:

To recognize the problems of the road builder.

To realize the needs of the road user.

To visualize future highway transport requirements.

To co-operate with the railroads and waterways to the end that the public may have in full that form of transportation which is most efficient, economical, and practical.

To study the problems attending the entrance of the motor truck into our commercial life in order that we may assist the industry which is industrially great and financially strong, in its efforts to be economically right.

To promote uniform legislation and encourage every movement for the safety of life and limb on the highway.

To encourage the establishment of motor express lines, where such lines will insure a fair return to the investor and serve a useful purpose in the community.

To gather such information and statistics as will be of value to those interested in determining the economic field for highway transport, and act as a clearing house for their dissemination.

The Law on Purchase of "Good Will"

If You Have Sold Your Business, or Intend to Sell, Do You Know What Courts Hold Concerning the Purchase of Good Will in an Effort to Prevent Competition?—A Definite Understanding Prevents Future Ill-Feeling

By Chesla C. Sherlock

One morning when the boys came down to work at the Sanderson shop, they noticed that the "old man" was engaged in earnest conversation with a stranger. As the morning wore on, the two became more and more interested in their discussion, making several trips through the shop, office and accessory department.

"You don't suppose Sanderson is going to sell out, do you?" Harry Ford asked one of the others. "It sure would be hard to work for anyone else after working for a man like him!"

"You said something, bo!" rejoined the other, fervently, "I don't think he'd sell out, though."

The expressed hope, however, did not materialize. In the evening, a little while before quitting time, Sanderson called the men together. He broke the news bluntly, as was his custom.

"Men, I'm sorry to tell you that I've decided to sell the Sanderson garage to Mr. Webb, of Chicago. He comes to me highly recommended and has stated it is his desire that each of you should continue at your old places. He wants the Sanderson garage to go on as before, and does not intend to even change the name.

"As for me, I don't know. I have always had a notion that I'd like to knock off work some time and try a little loafing. I may give that a whirl, but rather think the 'missis' will want to be taking that western trip she's been planning on so long, so I guess it's good-bye for a while at least, boys."

Sanderson went away. He was gone for a long time, traveling here and there throughout the West. In fact, he was gone throughout that fall and winter.

As for the boys in the garage, they greatly missed the blunt yet kindly "boss," although there wasn't much room for complaint against Mr. Webb. He didn't have the fine spirit,

the unselfishness and the personal interest in them that Sanderson had always had, but at that, he wasn't a bad fellow to work for, largely because he attended to his own business and let others mind their own.

People seldom like a confirmed meddler, but at the same time, it is a

days that went by, he loafed there most of the time. At first, he had appeared to be satisfied just to be back, but as the days went by, he plainly became nervous and ill at ease. Something was wrong with Sanderson and not one of the boys failed to notice it.

"What he needs," said Harry Ford, one day after after Sanderson had finally gone home, "is to have to work for a living again!"

Sanderson stayed away for two or three days and then one afternoon he came in again with something of his old enthusiasm.

"Boys, I hate to do it, on account of you, but I've decided to buy the garage across the alley. I tried to get Webb to let me buy back the old stand, but nothing doing! I wouldn't do it, but I've got to get something to do. It's killing me, laying around this way, when everyone else is at work."

Just then Webb came into the shop. He had caught a few of Sanderson's words.

"You are going to do what?" he asked.

Sanderson colored a little.

"Why, I am going to buy the garage across the alley," he answered, slowly.

"I'm sorry to disappoint you, Sanderson, but I can't permit it. You sold out to me, together with your 'good will' six months ago. That means that you can't

start up in business here again unless you have my consent. The courts have said that when a man sells his good will along with his business, he can't start up in competition with the purchaser."

Sanderson's face fell.

"Huh, that's a funny law," he mused. "Hasn't a man got a right to do business? I didn't say that I wouldn't go into the garage business again. I've acted in perfect good faith; I tried to buy back this place

(Concluded on page 40)

The Law

The study of law as a business instrument cannot be profitably disregarded. In the relations of the business man, either as a garage owner, a repair man, a tire dealer, or an accessory dealer, with customers, with employes, with fellow business men, a knowledge of commercial and industrial law ranks paramount with other attainments which help one on the road to success.

To be honest, to be prompt in paying debts, to be able to differentiate the rights of parties in the sale and interchange of goods, service, or business between buyer and seller, are essential and fundamental.

Some day, however, relations may assume appearances which may seem self-evident, but which the courts of law have decreed otherwise.

Many of such decisions have been handed down by the courts concerning certain relations in business which have turned the smile of cocksureness to the frown of failure.

In the garage business, none less than in other trades, perhaps more often, because of the youth of the trade, these mistakes, on account of lacking a knowledge of the law, have resulted in a great loss or even bankruptcy.

The law is flexible, changeable, blunt, unsympathetic, powerful. To know the law in business tempers the understanding, instills confidence, repels the dishonest, gives power, and helps you to achieve success.

pretty safe bet that they like to have someone come nosing around once in awhile to find out how one is getting along. It's human to like to have the other fellow get interested in you and your work.

That's what the boys missed most in Webb. Well, one day Sanderson blew into the garage, smiles all over, a little ruddier in the cheeks and with the same resounding wallop in his two big "mitts."

He spent the whole afternoon talking to the boys in the shop. In the

Merchants Must Know REAL Profits

Success of Any Mercantile Business Is Gauged Largely by Amount of Actual Net Profits but Dealers Often Deceive Themselves in This Matter Because They Have Failed to Properly Analyze Their Incomes

By Walter Engard

Economists have long divided all incomes into four divisions: rent, interest, wages or salary, and profit. It has been, and still is, their contention that the income of each individual is in the form of one or more of these four divisions.

It has been said, and rightly too, that the business man is not interested in the abstract distinctions made by the economist, but that they are interested only in the total amount of net earnings, rather than a theoretical division of this total amount into its economic constituents. That this is frequently the attitude of the business man cannot be denied, but it is this attitude that has caused the business man to fail to realize a REAL profit from his business.

As stated above, income is divided into four divisions: Rent, interest, wages or salary, and profit. Each of these four divisions is separate and distinct; that is, anyone of these four elements may constitute one's only means of income. For instance, one may own sufficient property that the revenue derived through the renting of these properties affords an income sufficiently large to satisfy his needs and he does not endeavor to add to his income through any of the other elements.

Again, one may have inherited or accumulated a sufficient sum of money that when put out at a fair rate of interest will afford an income plenty large to take care of his needs. He, too, does not endeavor to add to that income through any of the other elements. Then take, for instance, the poor man who is compelled to labor for a wage. Having neither property, money nor business, he finds this to be his only source of income.

Now take a capitalist who, although not actively engaged in any business enterprise, has a sufficient sum of money invested in profitable business enterprises in which he shares in the

profits to afford him an income large enough that he does not need to add to that income through any of the other elements. Here we have four instances where each one of these four



Walter Engard, Expert Writer on Merchandising and Sales Methods.

elements afford an adequate income entirely separate from each other.

But the presence of an income through any one of these four divisions does not bar a man from adding to his income through the remaining divisions; that is, a man may derive an income through two or more of these elements. He may own property, the rental of which affords him an income, and at the same time hold down a good position from which he obtains a very reasonable income. Or he may have money out at interest which affords him an income, or be interested financially in some business enterprise from which he derives an income.

Thus we see that each of these four divisions are independent of each other and each man has the right and the privilege of enjoying an income

through any one or two or more of these four divisions. The size of the income through each division will depend altogether upon the man's ability, his resources and cunningness.

The man with the greater amount of ability will receive a much larger salary than the man with less ability. The man with the larger amount of money will receive a much larger income through the interest thereon than the man with a smaller amount. The business man with greater judgment will make his business produce a larger profit than the business man who possesses a lesser degree of shrewdness.

Thus we find that every business man who is managing his own business is justly entitled to an income through three of these four divisions, while a larger number of business men are entitled to an income through all four of these divisions, which we shall endeavor to explain.

Let us take, for example, a business man who owns and controls a large business, the managing of which he has turned over to a salaried executive and does not devote any of his time to the business. This business man is entitled to two sources of income through the ownership of this business.

In the first place he has invested in the business, let us say, \$10,000. He is, therefore, entitled to a fair rate of interest on the capital he has invested. Some business men argue that if they do not charge their business with interest on the capital invested that their profits will be larger, and right here, as stated before, has been where the majority of business men have made mistakes.

The trouble lies in the fact that the profits are rarely ever any larger. Then this merchant is also entitled to an income through the profits of his enterprise. Here is where the

question, "What is Profit?" arises.

Profits are the rewards of management. They are the compensation of the owner of a business in return for the risk and the element of loss that exist in any business enterprise and which he necessarily assumes when he takes on that business. Therefore, this business man is entitled to a fair margin of profit independent of the interest which he should receive on his investment.

Now let us take another business man who owns and operates a business enterprise to which he gives all his time. In this case this merchant is not only entitled to a profit for assuming the risk and element of loss which exists and a reasonable rate of interest on his investment but he is also entitled to an adequate salary in payment for the services he renders independent of the other divisions of his income. Here again the business man argues that if he does not draw a salary his profits will be larger. But is this the case?

Not long ago I was discussing this subject of profit with a very prominent and successful merchant, at least apparently successful. During my interview I touched upon this subject of salary for the proprietor, and discovered that this merchant was not charging his business with a salary for his services. When asked why he did not handle his services in the same light in which he handled those of his employees, he answered:

"Well, you see whenever I need a little money I just draw \$25 or \$30 and charge to my account, and, not drawing a stated salary my profits will be larger."

"But," I asked, "would you work for some one else that way?"

"Surely not," he replied.

"What would you consider your services worth to another firm were you filling a like position and performing like duties, etc.?"

"I should judge that position such as mine should pay me at least \$2,400 a year," was his reply.

"Then why don't you make your business pay you a like salary?"

Same old argument—"profits will be larger if I don't take a salary." And upon further investigation I found that he was not charging any interest on his capital invested. Here you see this merchant was getting away from the divisions of income. He was interested only in the total amount of his net earnings and not in the division of the total amount into its economic constituents. But, were his profits larger? His books showed a net profit of a trifle more than \$2,000, a sum less than the amount he claimed his services should be worth.

This merchant had a capital of \$8,000 invested in his business upon

vested, into "cost of doing business."

Here you will see, according to this merchant's own statements, that he would have been better off financially had he been working for some one else. With a salary of \$2,400 and an interest earning of \$400 he would have had an income of at least \$2,800. He would have been \$800 a year better off in some one else's employ, to say nothing of the worry and risk of operating his own business.

This merchant was entitled to a reasonable rate of interest on his investment, an adequate salary for his services and a fair margin of profit. But instead of a profit when taken in its true meaning, he was actually

losing \$800 a year. This merchant was justly entitled to receive an income through three of the four elements of income: salary, interest and profit. If the success of any business enterprise is to be gauged by the profits it earns then this merchant was not conducting a successful business, although he was accumulating money.

Now let us take another merchant who is the owner of a business enterprise in which he has a sum of money invested and to which he devotes his entire time as manager of the business. This merchant also owns the building in which his business is operated. Such a merchant is entitled to receive an income through all four of the divisions of income. He is entitled to a rental for the build-

ing in which he conducts his business, a fair rate of interest on the capital he has invested, an adequate salary for the services he renders and a fair margin of profit in return for the risk and element of loss he has assumed through ownership of the business.

Now we have discussed three of the four divisions through which this merchant derives his income and I believe it is perfectly clear that they are justly entitled to receive first of all a reasonable salary in return for their services, then a fair rate of interest on the amount of capital they have invested in their business and

(Concluded on page 44)

What Are Profits ?

Mr. Merchant: Are you sure your business is turning you a REAL profit or are you fooling yourself? Before you can answer this question correctly you will first need to know what "profits" really are.

"Profits" are the most important part of a retail business, and it is, therefore, necessary that every merchant have a thorough understanding as to what "profits" really are. The success of any mercantile business is gauged very largely, if not altogether, by the amount of actual net profits. We are very often deceived in this matter of success of a business enterprise because we have failed to realize what "profit" is.

I have known business men who, from all outward appearances, were very successful in that they were enjoying a very nice volume of sales and accumulating a very substantial bank account. But when a thorough investigation was made it developed that they were not making a "profit" in its true meaning, in spite of the fact that they were accumulating a fortune.

which he was not charging a cent of interest. If this merchant had not been in business he would have invested that \$8,000 in some good, safe investment and it would have yielded him an income of at least \$400 a year without so much as turning his hand.

If he had not had this capital invested in his business some one else would have been glad to pay him for the use of it. Or had he not had the capital and been forced to go out and borrow this sum he would have had to pay at least this sum for the use of it. Therefore, it is entirely logical for this merchant to charge a fair rate of interest on capital that he has in-

Peril from Improper Storage of Oils

Proper Storage of Gasolene, Naphtha and Lubricating Oils Eliminates the Fire Peril Which Is Liable to Result from Explosion of Escaping Fumes—Preserves Quality of the Product, Conserves Its Efficiency and Eliminates Waste

By Charles E. Pask
Wayne Oil Tank & Pump Co.

In considering the dangers connected with the storage and handling of oils, we are apt to think only of gasolene and naphtha. This is a great mistake, as every oil carries with it a menace to life and property, and its handling should be safeguarded in every possible manner.

Until this fact is universally recognized and all oils are handled in fireproof, evaporation-proof steel storage tanks, we must expect to pay an enormous fire loss due to the careless handling of these products. It is true that the danger of handling gasolene is greater than in handling other oils. This danger is so well known, however, that familiarity with it has in many cases induced carelessness, so that it is well that we consider the treacherous nature of this product that we may always be on our guard.

Gasolene, unlike the other heavier petroleum products, constantly throws off an explosive vapor, even at extremely low temperatures. Five gallons of gasolene will generate 8,000 cu. ft. of gas, which, when ignited, expanded to 4,000 times this space. The explosive force of one gallon of gasolene properly mixed with air and compressed is equal to 83 2-3 pounds of dynamite, a force 14 times greater than dynamite.

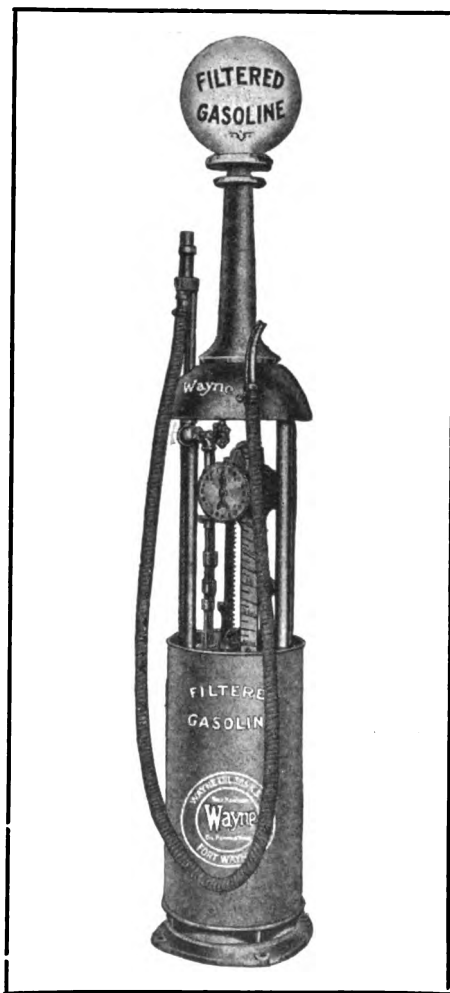
This means that if you have 100 gallons of gasolene on hand, you are storing the equivalent in explosive force to 8,366 pounds of dynamite. Gasolene is, in fact, more dangerous to handle than dynamite and there is more liability of an explosion. Dynamite will only explode from two or three causes, which must occur in its immediate vicinity, and which may be easily guarded against.

The vapor from gasolene is heavier than air. It settles to the floor and runs along the floor much as a stream of water would, only that it is an invisible stream. This vapor will settle and remain in a depression in the floor or under the floor for days and even weeks, unless disturbed by a circulation of air. A spark may cause the accumulated vapor to explode. This spark does not necessarily have to come from a lighted fire, but may occur through a person striking a nail in their shoe on a nail in the floor or other similar unavoidable causes. The records show that under certain atmospheric conditions, spontaneous combustion of this accumulated vapor will occur.

A case is on record in which the gasolene fumes were carried outside of a build-

ing to a lighted lamp 30 feet away from the building, taking fire and flashing back to the building, which was entirely consumed. If you are handling gasolene in any way but the right way, you are in just this position and you can never foresee when the blow will fall.

It is past understanding, in view of these facts, why many concerns, with their entire capital invested in the business, will give so little thought to safeguarding their interests. With the factory, shop, mill or



Large Gasolene Filling Pump.

mine heated, they will at night lock up this explosive in a warehouse or building adjacent to or connected with the main plant. After locking up fire and this explosive vapor together, they will, in effect, wager their entire investment against the merely nominal expense of fireproof storage that this vapor and this fire will not get together.

Kerosene is not as dangerous as gasolene, yet at a temperature of 70 degs. Fahr. or over it throws off an explosive vapor. At a higher temperature, say 80 degs. Fahr., in order to properly ventilate a room in which there is an open tank of kerosene, there should be kept up a circulation of air equal to 200 cu. ft. per minute for each gallon of the exposed oil.

These figures vary, of course, with the volatility of the oil and the temperature of the air and oil. Such a circulation of air is not practical in the usual manufacturing establishment. Hence the necessity is apparent for evaporation-proof, scientifically correct storage for kerosene as well as for gasolene.

All petroleum products, including lubricating oils, produce this explosive vapor. The danger from lubricating oils, however, is chiefly from spontaneous combustion where waste, sawdust or shavings are used to absorb the oils spilled on the floors. Many fires in factories and oil rooms have been traced directly to this cause, as it is a very common practice to neglect the accumulated refuse, which in time bursts into flames.

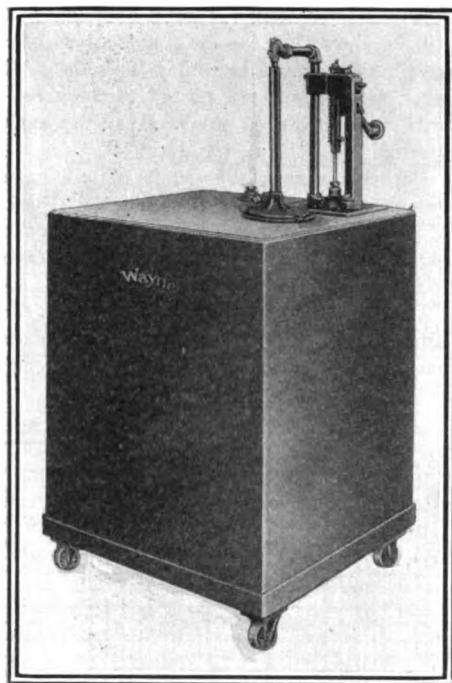
The gravest danger that confronts the consumer of oils aside from the gasolene danger is, however, from the paint oils, such as linseed oil and turpentine. A piece of cotton waste saturated lightly with equal parts of linseed oil and turpentine will, if left in a closed room, such as an oil house or storeroom for the night, burn from spontaneous combustion in three hours' time. Instances are not even lacking of fires being started in this manner when the waste or oil-soaked cloth was left in the open air.

Two years ago a fire occurred in Minneapolis from a cloth which had been used in oiling a floor and was left on the porch. North Dakota has, in the past year, suffered a loss running up into hundreds of thousands of dollars from fires started by spontaneous combustion in oil houses. This property loss is appalling, but who can estimate the value of lives sacrificed annually to the mistaken policy of "economy" in equipping an oil room?

We are living in an age of increasing danger to life and property from many causes unknown to our fathers. Developments of modern inventions in all lines such as electricity, automobiles, etc., each brings its corresponding increase in danger to life and property.

These advances in the development of

our civilization bring a responsibility that we cannot ignore. The merchants and the factories today are compelled to meet the conditions. For instance, they are compelled to store large quantities of various dangerous oils. Happily, we are, also, in an age when master minds have set them-



Castor-Portable Tank for Lubricating Oil.

selves to the problem of minimizing all such dangers. The storage and handling of oils has been reduced to an exact science, so that there are now available means of handling gasoline as safely as spring water.

Special equipment has also been designed for handling each and every oil in a manner best suited from the standpoint of economy, convenience and safety. The up-to-date merchant today is taking advantage of these appliances, so that we may in confidence look forward to a time when fires caused by careless handling of oils will be unknown. This will be brought about by various causes.

The instinct of self-preservation is strong with everybody, and all must realize the risk in the careless handling of explosives. The fact that these safety appliances conserve the efficiency of the product, preserve the quantity intact and enable losses to be turned into profits brings enormous pressure to bear upon the thoughtful man. Public opinion, national and state safety boards, will soon demand that every man will, at least, cease to menace unnecessarily his neighbor's property and his neighbor's life by lax methods in the handling of dangerous explosives.

The increasing prices of all kinds of oil and general economic requirements demand the proper storage and distribution of these liquids. Millions of dollars are lost annually due to the deterioration of the quality and waste in handling improperly stored

oils. Hot and cut bearings, prematurely worn machinery are very frequently due to deteriorated or contaminated oil.

This enormous loss is usually never traced to the right source—poor oil storage. The same criticism can be made of improperly stored paint oils, varnishes, dryers, etc. Competition in practically all lines demands economical production—that means elimination of waste so far as possible in every department of the industry.

All railroads, mines or manufacturing institutions maintain stockrooms for the purpose of receiving and distributing all of the supplies used by the institution. This is considered absolutely necessary in order to reduce losses and to maintain a cost system.

Money is invested in oils just the same as any other supplies, yet it is a known fact that in most institutions no record is maintained of the quantities received or dispensed. The purchasing, storing and distributing of lubricating and paint oils, gasoline, naphtha and other similar liquids is just as much a science and a part of the shop cost system as any other department.

Industrial plants of all kinds, especially railroads, are experimenting continually to learn how the cost of lubricating can be reduced and methods improved, forgetting apparently to investigate the oil house or the storeroom where the oils are stored and issued—the place where the percentage of loss is usually the greatest.

The installation of a modern storage system for oils, etc., need not necessarily imply the outlay of large sums. We have found this "big investment" idea on the part of men in charge of industrial institutions has frequently prevented them from considering the purchase of equipment.

It is not always necessary, or even advisable, to put in at one time all the equipment the management might feel would be needed ultimately. In many instances storage is provided for those oils or other liquids which most urgently require it. The balance of the equipment can be added as finances permit or exigencies demand.

Modern storage equipment for handling liquids is really divided into two general types. One for handling volatile liquids, such as gasoline, naphthas, paint oils and varnishes, and the other for handling non-volatile liquids such as lubricating oils.

The first of the two general types requires underground storage tanks for gasoline or naphtha and above-ground storage for the paint oils and varnishes. This arrangement usually meets with the demands of the various state laws governing this type of storage.

Where underground tanks are required they should be cylindrical in design. If made of galvanized steel all seams and rivets should be carefully made and then soldered inside and out. If heavy metal is used such as three-sixteenths steel or heavier weights as conditions or the capacity of the tank may make necessary, then all

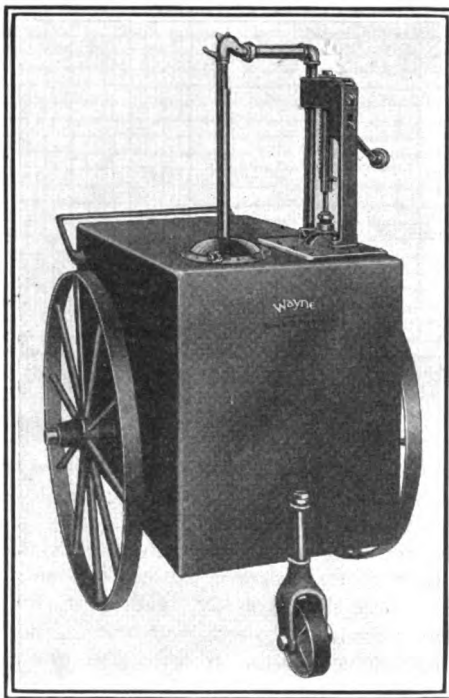
seams and rivets should be carefully caulked. Storage tanks for volatile liquids require special care in construction. A tank may hold water or steam pressure, but it is usually unfit for volatile liquid storage purposes.

If above-ground tanks are essential, these are made in rectangular shapes, the height and length remaining constant and the width varying according to capacity desired. This arrangement permits the addition of other individual units to the system and does not destroy the uniformity of the battery of storage equipment.

Specially designed pumps of either the measuring or non-measuring type are connected by pipe lines to tanks buried underground or inserted in the top of tanks for above-ground use. Accurate devices are provided on the measuring pumps for the delivery of desired quantities of liquid.

Gear-driven meters may be added for the purpose of checking consumption. Locks are supplied on both types of tanks and on the pumps as well. This prevents unauthorized usage and theft.

Where a battery of individual units is used barrel tracks and barrel drainers are used in connection with small chain hoists. This makes it very easy to handle the barrels and drain them completely into the manhole of the tanks. This saves labor, time, and liquid, and prevents the loss of liquid due to the return of liquid in bar-



Wheel-Portable Tank for Lubricating Oil.

rels which cannot be properly drained by the old-style spigot method.

Dirt, dust, and sediment are kept from the liquids; fire danger is entirely eliminated; valuable storage space is saved; labor is lessened; cost and consumption are easily arrived at.

Accounting:

The Standard Cash Journal and Bank Register Is the Garageman's Register of His Daily Transactions—It Is the Master Record of His Business—It Represents the Best and Most Advanced Ideas of Accounting—It Is Very Simple, Accessible, Easy to Use, and a Great Time-Saver

By J. Newton Boddy

Manager, System Department, Tanner, Gilman & Ellis, Chicago

The cash journal and bank register is, as its name implies, the book of record for the daily business transactions. In it the daily business is recorded, accumulated, and analyzed to show the results of business transactions daily and to date. It is your business summary, the master record of you business.

It combines, as you will see, the day book, journal, cash book, and bank register, and gives you at all times a book of ready access for any information vital to you in the successful operation of your business. It represents the best and most advanced

and, as your work has been checked daily, you have the satisfaction of knowing your statement is correct.

The posting of all debits on one side and all credits on the other, gives you at all times, after each entry, if necessary, an automatic balance. This journal gives you an "up-to-the-minute" check on your business accounts and provides you with a book of ready reference for your directors or those financially interested in your business.

You, who have been using only a small day book, or cash book, and a ledger with no systematic chart of business accounts

journal, or pay roll record is used, all that will be shown on the cash journal will be daily totals from these other journals. All other transactions not posted to these records will be posted in detail to the cash journal.

For this reason the details of all cash receipts, except cash sales and the details of all cash disbursements, except petty cash expenditures, will be shown on the cash journal.

Cash sales are posted in detail in the sales journal and from there posted to the cash journal in the daily total. Petty cash

[illegible]

The Debit Side of Facing Pages of Cash Journal and Bank Register Showing the Entries Enumerated in the Text.

ideas of accounting. It is simple, easy to use, and a great time-saver. Detail information is classified in this journal to show the actual conditions of each and every general ledger or business account.

It will show you the amounts of your purchases, your sales, your receipts, and your expenditures. It will give you a comparison of the business one day with another, one period with another. It will show you what you owe, what others owe you, and the condition of your bank account. With its help, you can quickly determine whether you are making or losing money.

From this journal you get complete information that will enable you to prepare, in a short time, a true financial statement.

may, on first reading, look upon this system of bookkeeping as too elaborate for your use, but you should know that no department of your business is more important than the bookkeeping.

In succeeding articles we shall illustrate and explain all the forms which may be used by the average garageman or auto dealer in recording his business. According to individual requirements, you may use but two or three of them. However, the cash journal and bank register in some form is indispensable in any efficient book-keeping system.

If the sales journal and purchasing journal are not used, the details of all sales and purchases will be entered in the cash journal. When the sales journal, purchase

disbursements are posted in detail in the purchase journal and from there posted to the cash journal in the daily total. If a pay roll is kept, the distribution of the pay roll is posted to the cash journal in totals from pay roll sheets, the pay roll account being credited with the total pay roll. When disbursement is made for pay roll either in currency or by check, pay roll account is debited and cash account credited in the cash journal.

As the income tax department now requires you to file schedules of wages and salaries paid, it is more than ever advisable to carry a separate record for pay roll.

To illustrate the use of this cash journal, we submit a few typical transactions which took place on November 3, 1919:

John Jones paid on account \$10.

Harry Smith paid on account \$20.

Will James paid on note \$200: Interest, \$5.60.

Discounted Will Henry's note at First National Bank.

Deposited in bank, \$2,000. Discount,
\$120.

Shop work tickets show \$70, labor chargeable to customers.

Sold office desk for \$60, which cost \$75 a few months earlier. Purchaser, John Fulton, paid \$20 on account.

William Franklin gave his note at 90 days for \$423.50 to balance his account.

Paid sight draft, \$2,000, for automobiles.

Paid \$124 for freight on above.

Drew check for \$36.70 to reimburse petty cash.

Wrote off as bad debt Frank Short's account of \$82.60.

Paid Wilbur White, bookkeeper, \$40 sal-

\$400; general expense, \$65; sales expense, \$97.60.

Credits: Accounts payable, \$1,915; notes payable, \$350; petty cash, \$7.60.

The details of these transactions, as in the case of the sales journal, will be shown when we illustrate the use of the purchase journal. At that time, we will illustrate the detail posting to the cash journal when a purchase journal is not used.

These postings, whether made to the cash journal, sales journal, purchase journal or pay roll must, of course, be identified by the original memo whether it be sales ticket, invoice, check stub, time card, or job ticket.

In conclusion we would suggest that your year be divided into 13 accounting periods of four weeks each, ending Saturday to make the accounting for pay roll easier and to give a more equal comparison, one period with another.

As we wish to reach the end of the gar-

ins. with an 11-in. by 10 $\frac{1}{4}$ -in. cut leaf. This is a standard size leaf and is used almost entirely for the forms in this system—Cash Journal, Sales Journal, Pay Roll, Purchase Journal, Daily Balances, General Ledger, Sales Ledger, Purchase Ledger, Expense Ledger, Stock Ledger, Car Register, Car Ledger, etc. In this way a minimum number of binders is required and your records are centralized.

Division of Business Expenses.

We have been reading with interest the articles on garage accounting and we would like to ask you a few questions.

We have a garage and sales agency in partnership with another man. Each week we take out \$10 for general expenses which are incurred in making sales, such as cigars, fares, etc. Sometimes we spend only a small amount of this \$10. Should this \$10 be charged to pay roll or expenses?

We carry our investments under garage

[illegible]

The Credit Side of Facing Pages of Cash-Journal and Bank Register Showing the Entries Enumerated in the Text.

ary for week ending November 1, 1919.

Sales journal shows the following totals for day: Sales, \$1,825; war tax, \$180; notes receivable, \$1,200; accounts receivable, \$100; used Reo in trade, \$400; cash sales, \$125.

The details of these transactions will be shown when we illustrate the use of the sales journal. At that time we will illustrate the detail posting to the cash journal when a sales journal is not used:

Geo. Ellington and F. S. Kelly each paid \$100 deposit on new cars to be delivered out of next carload.

The purchase journal showed the following totals for the day:

Debits: Merchandise, \$1,360; office furniture and fixtures, \$350; shop equipment,

age accounting system in as short a time as is consistent with a thorough understanding of the underlying principles, we are as nearly as possible limiting our writing to a topic an article.

We could write a book on the application of the cash journal to garage accounting.

If there is any doubt in your mind about the application of the cash journal to your business, let us hear from you. Send us some of your sample transactions and we will answer you personally, show you the postings and trace the transactions through the books of record.

The size of the form illustrated is 11 ins. by 21 ins. The writer, by using a cut leaf, reduces this form to a sheet 11 ins. by 14

account and, in addition, each has a personal account. Each month our profit and loss is added to the garage account and from that our present worth is obtained. Do you think it is better to split up the investment into our respective amounts and have only personal accounts to which a proportionate amount of the profits or loss is added or deducted each month instead of our present way of doing it? With the first of the year not far off, we would like to know which is the better way of doing this?—S. M., N. I.

If the money taken out each week for incidental expenses is used only for promoting sales, it should be charged to sales expense under the proper heading—carfare, cigars, entertainment, etc. If this money is used for all petty expenses, it should be

(Concluded on page 36.)

Cold Chisel—How to Make and Use It

The Cold Chisel Is a Very Simple Looking Tool, but There Is a Great Deal to It—You Find It Wherever You Find Machines—And Yet No Tool Is More Abused—Simple Method of Making Chisels, Hardening and Tempering

By J. N. Bagley

Not long ago the writer happened to be away from home and made an attempt to catch a train that was just leaving town, and the result was that I waited for the next train some five hours later. During this time I visited a garage that was but a little way from the depot and had a very pleasant chat with its proprietor as to conditions, prices, etc.

I had spent about an hour in the office when the manager had a call to go out in the country to pull in a "dead one." He invited me to go along with him for the ride, but as I had just missed one train, and there would be a chance to miss another, especially if I went out fooling about after dead wagons, I told him, if it was all the same to him, I would go back in the shop and visit the head mechanic. He advised me that this would be all right, and invited me to make myself at home about the place.

After watching him disappear up the road to the south, I turned about and sauntered back to the workshop where five or six fellows were operating on cars, gas engines, etc. The foreman of the place was not very busy, just stirring about to see how things were going, when a customer came in with a special job he wanted done quickly. The foreman took the work in hand and went over to the bench to work. I watched the other boys a few minutes and went over near the bench and sat down on the running board of a car that had had the engine removed for repair, as I didn't care to be standing about in the way of the workmen.

The foreman by this time had a shaft in the vise and was looking about for a chisel to remove some metal so that a collar could be fitted to it. The first one he picked up was a three-eighths octagon about six inches long. Then he hunted about for a hammer, and after moving a conglomeration of tools about the bench, he finally succeeded in resurrecting a two-pound hammer. With this little six by three-eighths inch chisel and a two-pound hammer, the "mechanic" went over to the vise where the work was held and began to work.

He placed the chisel where he wanted it and struck it a couple of blows with the

two-pound hammer and the chisel bent about two inches above the cutting edge. The mechanic—anyhow, we will call him a mechanic for luck—spat under the bench and remarked, "Of all the damn chisels they have about this place!" and began to look about for another chisel.

After searching about for 20 or 30 minutes for another chisel, he finally located a chisel made from half-inch stock, about what he thought he wanted. During the hunt for the second chisel, someone got his hammer—that two-pounder—and again he started on a hunt for another hammer to use with the second chisel. He finally found a small, eight-ounce, ball-peen hammer and started to work on the shaft he had placed in the vise nearly an hour before.

The hammer was just as much under size for a chisel made from one-half-inch stock as the two-pound hammer was too heavy for the chisel made from three-eighths-inch stock, consequently the job was not progressing very rapidly. I watched this

railroad engineer—in fact, where you find machines, you find cold chisels. A cold chisel is a valuable tool and deserves just as much attention and consideration as do the taps and dies, the files, or the saws.

Many mechanics make their own chisels, buying the stock from the supply houses, while others prefer to buy them already made up. But in case one is to buy his chisel, he should be able to make a chisel for every job, for some day a particular piece of work will come along requiring a special chisel that cannot be had from stock—and then there are the old chisels to dress up and re-temper from time to time. Quite often a chisel will break down even though it is properly made. If the mechanic cannot work it over and rebuild it, the chisel is a total loss.

Selecting the proper chisel for the job, and the proper weight hammer to use in every instance, has much to do with results. For instance, a two-pound hammer should not be used on a chisel made from three-eighths inch stock—neither should a

small hammer be used on a chisel made from heavy stock. A light hammer on a heavy chisel has a tendency to rive the head of the chisel rather than to force the chisel into the work.

One the other hand, if the cold chisel is small and the hammer heavy, the weight of the hammer is such that the chisel will either bend or break, as it cannot be driven into the bar, except

when the cut is light and shallow.

Sizes and Shapes of Chisels.

At this time a few hints on making chisels of different sizes for different purposes will no doubt be of value to some reader. The first thing to consider is the work the chisel is to do and second, the material of which to make it and the shape it must be made to do the work the smoothest.

The stock may be either round, hexagon, octagon, flat or square. Steel having two broad flats, diametrically opposite, is a very good steel to use where it can be obtained, for it is much easier to hold in the hand during use. The flats act as a guide when grinding the faces that form the cutting edge. This style of chisel is shown in Fig. 1-D. A very similar chisel made from

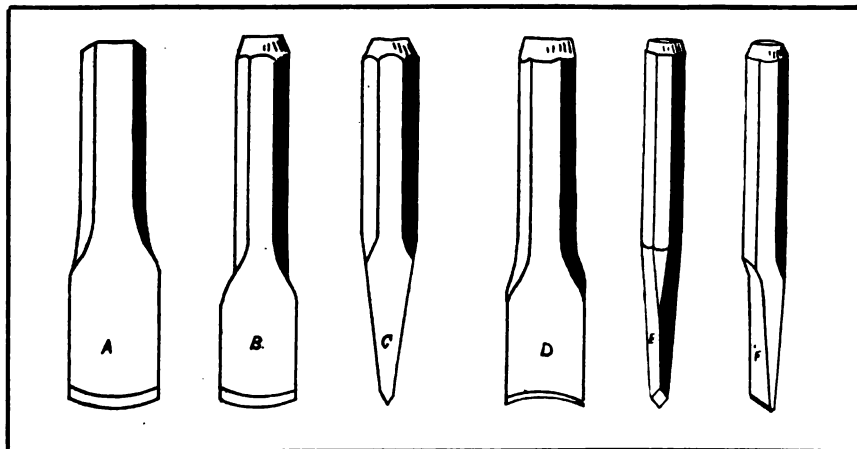


Fig. 1.—The Different Styles of Chisels Showing Shape of Cutting Edges.

until I lost interest and as my train—the second one—was just about due, I sauntered over to the depot so as to be sure of getting home.

All along the way home I was just thinking: "Someone was paying for that man's time; someone was buying the tools he was breaking up, all because he did not know how to use a tool—a common cold chisel."

Just to look at it, a cold chisel is a very simple looking tool, but there is a great deal to it after all. It is wonderful what a good mechanic will do with a variety of chisels and a few hammers, gauged in size. I doubt very much if there is a tool in all the world that is more abused than the cold chisel.

They are used by nearly every man on the farm, every mechanic in the shop, the

hexagon stock is illustrated in Fig. 1-B.

Both chisels have a rounded cutting face, this, however, is optional for the same chisel can be made with straight face if desired. In Fig. 1-C, we have the chisel turned edgewise showing how the facets are ground for cutting. In case the metal

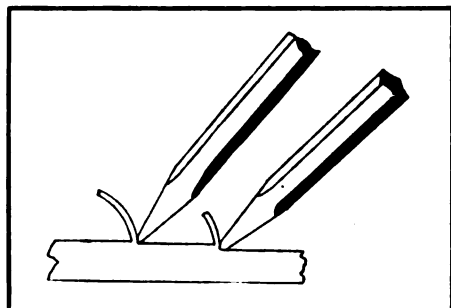


Fig. 2.—Different Cutting Angles.

is soft, the angle of the facets will differ from the facets for hard metal—the short thick cutting edge for heavy, rough work, and the thinner one for softer metal especially where the work to be cut is very light.

Chisels of this style can be made from any stock ranging in size from 3/16 inch to one inch. For the general repairshop work, the chisel made from stock from 3/8 to 1/2 inch is usually found to be the most practicable with a length of about six inches. In Fig. 1-D, we have a chisel very similar to those already described, except the cutting edge is ground concave for special work.

In Fig. 1-E is shown a type of chisel known among most mechanics as the diamond point. This chisel is used more for roughing-out heavy cuts, or making deep cuts having corners. A hole can be cut deep and very straight with the diamond-point chisel. In selecting stock for the dia-

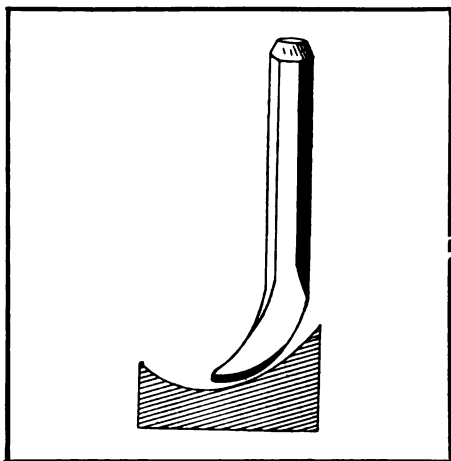


Fig. 3.—Chisel for Cutting Oil Grooves.

mond-point chisel, the work in hand must be considered, and the chisel made accordingly. A small chisel would not answer well for a four-inch shaft, neither would a three-quarter inch chisel be of any value in working on a three-eighth inch shaft.

In Fig. 1-F we have a type of chisel

which is very handy for slipping off the heads of rivets or removing small, irregular knobs or bunches from the surfaces of castings.

The round nose chisel should be made straight from the widest point to within one-fourth of an inch from the cutting edge, so as to permit of the chisel being raised and lowered to govern the depth of the cut. This rule not only applies to the round nose chisel, but to all chisels used for this or similar work whether the face be curved or straight.

Two chisels for the same work but having the cutting edge ground at a different angle are shown in Fig. 2. It will be noticed that the chisel ahead is more liable to gouge and cut deeper than the one following. The chisel following will also cut a heavier cut with less danger of breaking than the chisel ahead, considering both chisels made from the same stock and the blows made with the same hammer. The chisel following will cut with less ef-

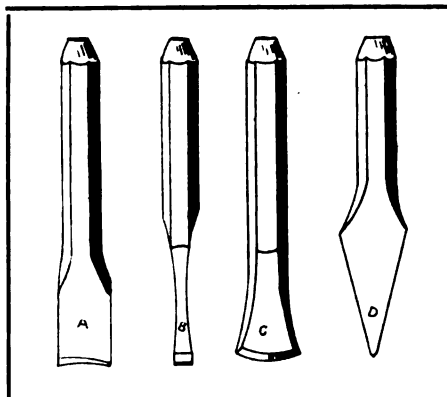


Fig. 4.—Additional Styles of Chisels.

fort than the chisel ahead and cut a much smoother, cleaner cut.

A chisel of peculiar shape adapted to the cutting of oil channels and grooves in brass or babbitt boxes is shown in Fig. 3. The depth of the cut is governed by the pressure on the outer end of the chisel. The size of the hammer has much to do with the clean, even cut. A heavy hammer will swell the metal at either side of the chisel and cut the oil channel deeper than necessary. However, if the hammer is light and the chisel properly guided, the cut will be smooth and clean with no ragged edges. The chisel should be ground so it nearly fits the periphery of the bearing so the heel of the chisel bears in the channel regulating the cut in the metal.

Many times it is necessary to have a very long chisel of this type, in which case the body of the chisel should be sufficiently heavy so that it cannot spring in the middle causing the cut to be ragged and uneven in the bottom. Hardly any two bearings will require the same shape chisel, therefore, it is advisable to have a variety of chisels which will cut oil channels in boxes having a periphery of from one-inch to three inches.

In Fig. 4-A, the style of chisel shown is very useful for cutting close into the corners after the rough work has been done with the chisel described as a diamond point. Fig. 4-B illustrates a chisel for cutting keyways after they have been roughed-out with the diamond-point chisel. This

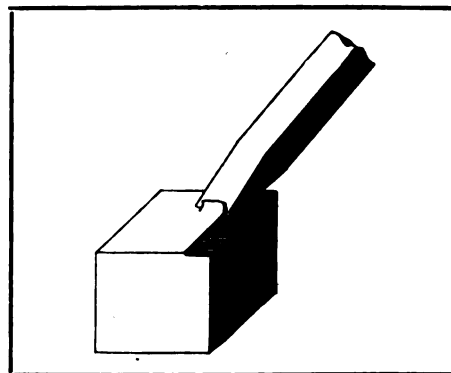


Fig. 5.—Correct Way of Holding Chisel.

chisel should be ground to the width desired, a trifle wider at the point so it will not bind or stick at the edges as it is forced along the keyway.

Grasp this chisel firmly and strike with the hammer, at the same time following up the blow with the pressure of the hand holding the chisel so that it does not back away each time it is struck. The depth of the cut is governed by the position of the chisel. The flat view of this chisel is about that as shown in Fig. 4-D. In Fig. 4-C, we have what we term the "cow-mouth" chisel. This chisel will be found a very good chisel to have in your assortment, although it is used only for special jobs.

A very good way to hold the chisel for good results on ordinary cutting is shown in Fig. 5. A cut can be taken from the side and the second cut followed up as shown. The depth of the cut is governed by the position of the chisel and the blow of the hammer. Care should be taken to strike each blow with as nearly the same force as possible. The position shown is for cutting a steel block. To chip or cut cast iron, the chisel should be straightened up a trifle and the facet of the chisel should be ground much more stubby, so to speak.

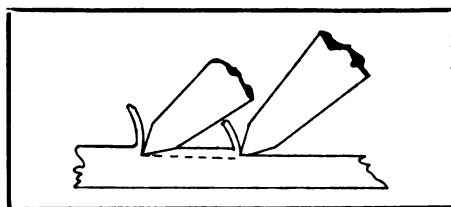


Fig. 6.—Wrong Way of Holding Chisel.

The manner of holding the chisel for cutting, as shown in Fig. 6, is wrong. The chisel ahead will cut deeper, for the chisel is slanted wrong for the grinding of the cutting edge. The chisel following will not cut a straight, smooth surface, for it is not lying down as it should. By dropping the
(Concluded on page 42.)

Law and The Automotive Industry

Decision by Indiana High Court in Case Where Truck Was Taken on Lien by Garageman to Secure Payment for Repairs and Gasolene—Truck Was Purchased on Conditional Sale Contract and Dealer Claimed Prior Lien

By R. R. Rossing

It often happens that the operator of an automobile truck bought on time-payments, runs up a bill for gasolene or repairs at a garage, and that, when unable to pay, a question arises whether the prior lien is held by the garageman or the dealer who sold the truck on the conditional sale contract.

The Appellate Court of Indiana on October 7, 1919, resolved such a case in favor of the seller, in reversing the decision of the lower court in the case of Partlow-Jenkins Motor Car Co. v. Fred Stratton.

The facts are that George Fitch bought the truck of the Partlow-Jenkins Co. and later obtained repairs and gasolene therefor from Fred Stratton, dealer and garage operator of Carmel, Ind., to the value of \$283.29.

Then several months later Fitch called Stratton on the telephone and told him he could take the truck, whereupon Stratton two days later filed a lien in the office of the recorder of Hamilton County.

The Partlow-Jenkins Co. demanded of Fitch and Stratton that they give possession of the truck, and being refused, brought this suit in replevin. The Circuit Court of Hamilton County gave judgment in favor of defendants, but the supreme court held in favor of the Partlow-Jenkins Co. in the following decision, by Chief Justice Batman:

"It is well settled in this state that where the owner of personal property sells and delivers it to a purchaser, not for the purpose of consumption or resale, at an agreed price payable at a future day, upon the express condition and agreement that the title to such property shall remain in the vendor thereof until the purchase price is fully paid, the vendee of such property, prior to such payment, can neither sell nor incumber the property in such manner as to defeat the title of the original owner and vendor thereof. *Cable Co. v. McElhoe*, 58 Ind. App. 637, 108 N. E. 790.

"It follows that unless the evidence shows that said Fitch had either express or implied authority from ap-

pellant to contract for said storage, supplies, and repairs, that appellant's rights as conditional vendor are superior to said lien of appellee. It is not claimed that the evidence shows that said Fitch had any express authority in that regard, and there is no just ground for any such claim.

"It has been held in this state that, where property is to be retained and used by the mortgagor for a long period of time, it will be presumed to have been the intention of the parties to the mortgage, where it is property liable to such repairs, that it is to be kept in repair; and when the property is machinery, or property of a char-

The man who knows it all and who cannot benefit by the successes and failures of those in the same line as himself and even in other lines, is to be pitied. We are all furnished with baskets of different sizes—mental capacities—and some have such small baskets that they get them full mighty soon!

acter which renders it necessary to intrust it to a mechanic or machinist to make such repairs, the mortgagor in possession will be constituted the agent of the mortgagee to procure the repairs to be made.

And, since, as a rule all such necessary repairs are for the betterment of the property, and add to its value to the gain of the mortgagee, the common-law lien in favor of the mechanic for the value of the repairs is paramount and superior to the lien of the mortgagee. The mortgagee is presumed in such case to have contracted with a knowledge of the law giving to a mechanic a lien.

"But where the lien is purely statutory, or where the property is of such a character that it would not be reasonable to anticipate the necessity for any needed repairs for the period of time the property is to or does remain in the possession of the mortgagor, or when it is but reasonable to expect the mortgagor in person to care for or repair the property, in such cases a dif-

ferent rule may prevail. *Watts, etc., v. Sweeney* (1890) 127 Ind. 116, 26 N. E. 680, 22 Am. St. Rep. 615. The same rule would apply where the rights involved are those of a conditional vendor instead of a mortgagee.

"An application of this rule to the evidence in this case leaves in our mind very grave doubts whether it is shown that said Fitch had any authority from appellant to contract for any portion of the alleged storage, supplies, or repairs, but as to one item thereof we are clearly of the opinion that no such authority is shown.

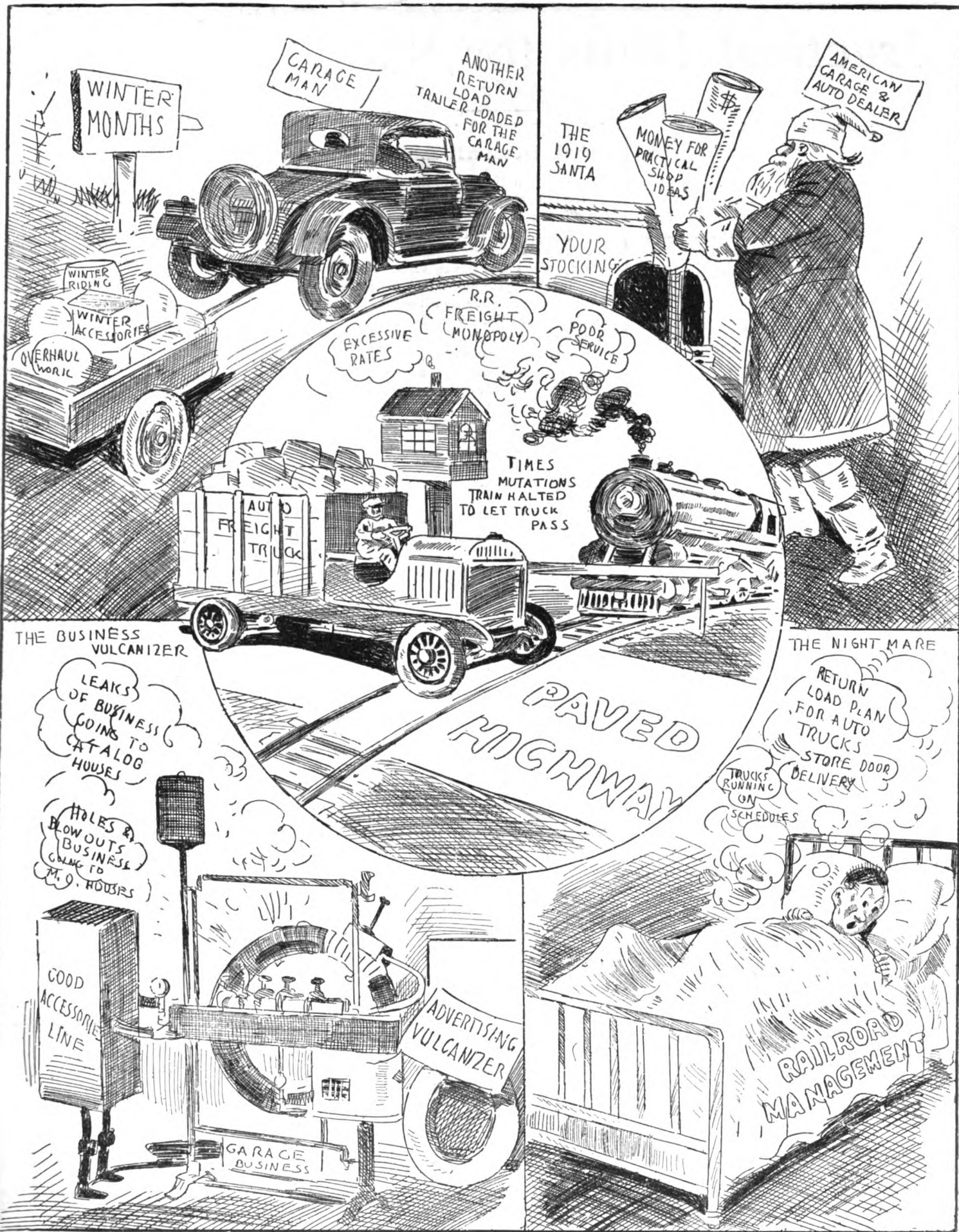
"It will be observed that appellee alleged in his cross-complaint that the supplies which he furnished for said truck, and which entered into his total claim of \$283.29, included gasolene, which we may reasonably infer was used in operating said truck.

"This fact, having been alleged in a pleading filed by appellee in the cause, may properly be considered, in connection with the evidence in determining the character of the supplies furnished by appellee for said truck and entering into the amount of his alleged lien. *Colter v. Calloway* (1879) 68 Ind. 219; *Bell v. Pavey* (1893) 7 Ind. App. 19, 33 N. E. 1011.

"There is no evidence of any fact from which it can be implied that Fitch had authority from appellant to purchase this item of supplies. Where courts have held that a mortgagor or conditional vendee in possession will be deemed the agent of the mortgagee or conditional vendor to procure repairs to be made, the decisions have usually been based on a presumption that from the nature of the property, the use to which it was to be applied, the knowledge that in such use repairs would probably be required, and other similar facts, the mortgagee or conditional vendor manifestly intended that such agency should exist.

"This, it has been said, works no injustice to the mortgagee or conditional vendor, since the repairs made ordinarily enhance the value of the property to the extent of the reasonable

(Concluded on page 37.)



Practical Hints for Shop Mechanics

Conducted by E. C. Pohlmann

Preventing Isinglass Cracking.

To prevent isinglass from cracking and breaking, put on a thin coat of vaseline on both sides of the glass. Allow it to set in the sun or some warm place for two or three hours and then wipe off.

If this treatment is given the glass every month or so, it will be found that no more glasses will be broken.—R. W. T., Kans.

* * *

Tire Kink.

Occasionally you are called on to repair a blowout that is so bad that an inside sleeve will not hold, and a lace or boot is not handy.

I have repaired quite a few blowouts, and once an eight-inch rim cut, in which case an inside boot wouldn't do at all.

Take a strip of light canvas about eight or ten inches wide and two or three feet long. Inflate the tube to the size it will be when in the casing and wrap the cloth smoothly around the tube. Use an inside sleeve and place the wrapped part of the tube in the casing where the hole is. Be sure that the tube is inflated to the right size before wrapping the canvas.

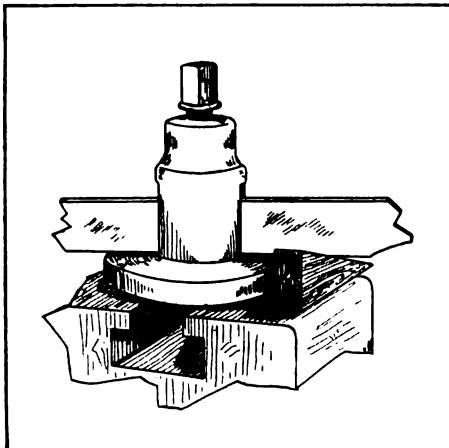
If inflated too much, the wrapping will be loose in the casing, and if not enough, it won't allow the bead to clinch and the pressure is apt to blow the tire off the rim.—H. C., Utah.

* * *

Prevent Chattering.

Very often in boring out holes on a lathe, trouble is experienced in producing a good finish free from chatter marks.

This difficulty may be overcome by driving a wooden wedge between the tool and



Method of Preventing Chattering.

the top of the cross slide as shown in the illustration.

Keep the wedge tightly in place by striking it occasionally with a hammer while working. Hardwood is much better to use than

ONE DOLLAR EACH!

Each shop hint and illustration printed in this department means one dollar or a renewal of subscription to the person sending it in. You have some time or labor saving ideas which you know are thoroughly practical. Tell us about them in your own language. Write out a brief description, with a sketch if necessary, that is all we require. We will fix up the sketch for reproduction, a finished drawing is not needed, simply a free-hand sketch. You get a dollar if the idea is worth publishing.

soft wood because it is more resistant to depression.—C. A., Miss.

* * *

Wood Alcohol.

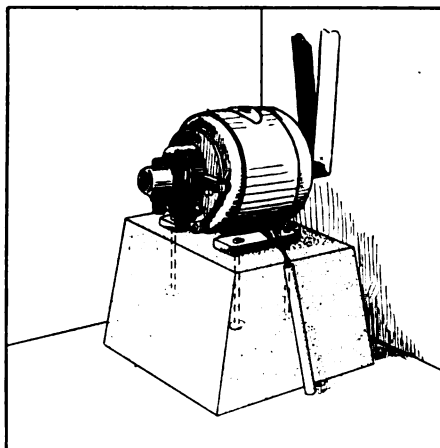
When wood alcohol is to be used to any extent, have the room very well ventilated, as it affects the eyes and even produces blindness.—Marine Engineering.

* * *

Shop Motor Pedestal.

No repair shop can be complete without a motor for the purpose of driving shop machinery. Both floor and ceiling locations have their objections, while putting the electric motor for driving shop machinery on a pedestal will overcome such objections.

That is, when hung from the ceiling it is impossible to mount the motor firmly,



Shop Motor Pedestal.

and it is also inaccessible, while a motor installed on the floor exposes it to possible injury, also the accumulation of dirt. Should the floor be constructed of concrete it is preferable to make the pedestal

of the same material; if of wood, structural steel should be employed. In order that the motor may be held solidly on the pedestal, and steady the foundation on the floor, long bolts, straps or rods, as indicated in the accompanying illustration, should be used.—C. S., Ill.

* * *

Gear Driving Tool.

When driving a gear onto a shaft, the operator should be extremely careful not to injure the gear or the shaft in any way. A useful kink which will remove this difficulty can be made from a piece of heavy pipe with a solid head, conical in shape, fitted at the end for the purpose of receiving the hammer blows.—S. C. L., Ill.

* * *

Air Line Whistle for Shop Signal.

I picked up an old exhaust whistle from the junk pile and connected it to the air line from the air compressor tank. From the whistle I ran a cord to the telephone.

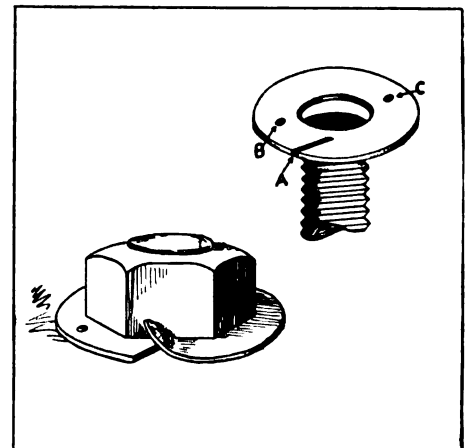
We use the whistle to call the manager, garage foreman, battery man, etc., to the telephone. Each person has a certain number of blasts. We have found it very useful, especially so, because it can be heard above all other noises in the garage.—B. E. S., Tenn.

* * *

Lock Washer.

If you should unconsciously use up all the lock washers of a certain size and none can be obtained in a short time, the following one can be easily made, for it is very simple:

In the illustration, *A* is a slot in the



A Simple Lock Washer.

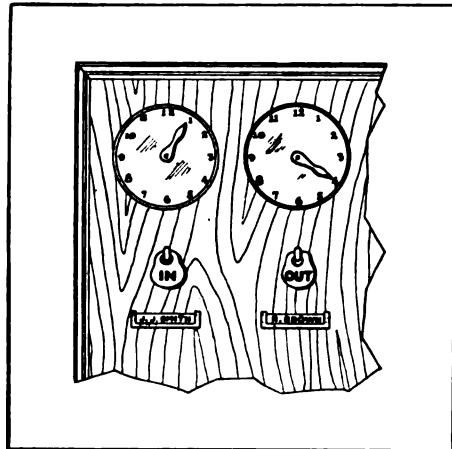
washer; *B* is a small hole on the same radius as *C*, which is a small cone-shaped projection. When used on metal, place the washer in position and with a center punch make a depression through hole *B*, rotate

the washer until projection *C* fits into center-punch mark, screw down the nut and turn up the edge of the washer at slot *A*, alongside of the nut. When used on wood, no punch-mark is necessary.—P. H. C., Ohio.

* * *

Employees' Check Panel.

In a shop which employs several workmen it is necessary that the foreman check



Employees' Check Panel.

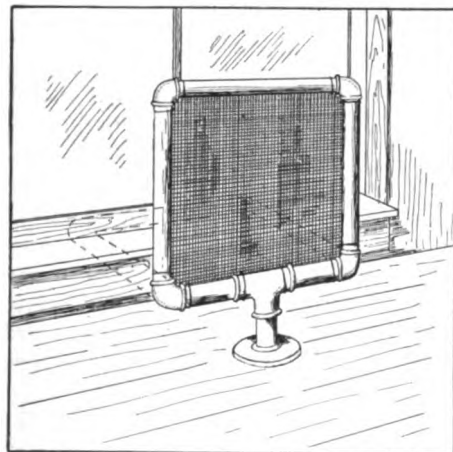
up their movements. Install a large board panel on which clock faces are fitted, one for each workman.

On the clock face can be indicated the exact time the workman expects to return. On a hook just beneath the clock hang a check, with "out" on one side and "in" on the other side. The name of the workman can be carried in a small rack beneath the check. By the use of this system the foreman can readily see what workmen are in the shop, and the exact time when those who are out will return.—C. S., Ill.

* * *

Chip Shield and Tool Holder.

In many repair shops where the workbench is next to the window and the vise



Chip Shield and Tool Holder.

usually in front of the window, it is necessary when doing certain kinds of work to have some kind of a screen in front of it.

When chipping a piece of iron, the window is liable to become cracked or broken

from the flying chips. To prevent this, make up a portable screen as shown in the illustration. This can be made as shown from some old pipes and a piece of screen.

Furthermore, this screen can be used as a holder for small tools, calipers, rules, etc., when working at the vise. To use it for this purpose, all that is necessary is to turn the screen through 90 degrees, the threads at the tee readily permitting such turning.—S. E., N. Y.

* * *

Headlight Frosting.

An efficient way to dim headlights is to dissolve a dime's worth of epsom salts in a teacupful of water, and apply the solution to the inside of the glass and allow it to evaporate. The resultant frosting should last on the lens for a number of months.

* * *

Motor Lubrication.

To increase the power of your motor, to make it run more smoothly and at the same time oil and decrease the wear on valves and valve seats and cut carbon from the pistons and valves, connect an $\frac{1}{8}$ -inch copper pipe from the breather pipe on the oil intake to the air intake on the carburetor.

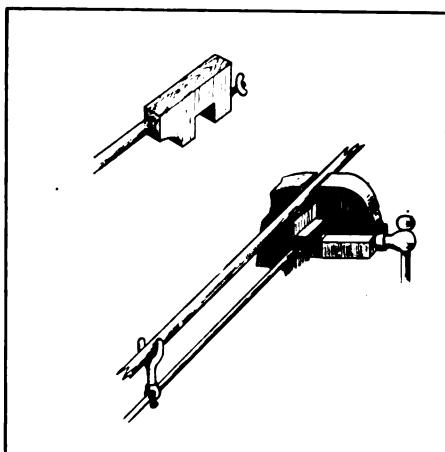
This will prevent the excessive pumping of oil to a certain extent and utilize the vapors given off by the hot oil which are of sufficient low combustible character to increase combustion, and at the same time, directly lubricate the valves and cylinder walls.—H. W. M., Texas.

* * *

Extension Support for Vise.

Many repairmen experience considerable trouble when working on a long piece of shafting of one kind or another in a vise. The workpiece, especially if it is of considerable length, has a tendency to drop on account of its weight.

An extension support as shown in the



Extension Support for Vise.

illustration can easily be made from some odds and ends which are around the shop.

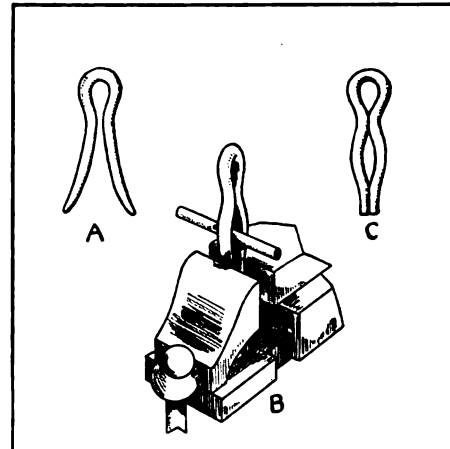
The body of the extension can be made of a piece of iron cut to fit the vise screw and can be fastened by means of an ordi-

nary machine bolt. The extension can be made of a piece of pipe threaded and screwed into the body proper. The yoke at the end can be shaped from an old brake rod and fastened to the extension piece as illustrated.—M. H., Conn.

* * *

Re-using a Cotter-pin.

The next time you try to replace a used cotter-pin which is spread at the end, as



Bringing Ends of Cotter Pin Together.

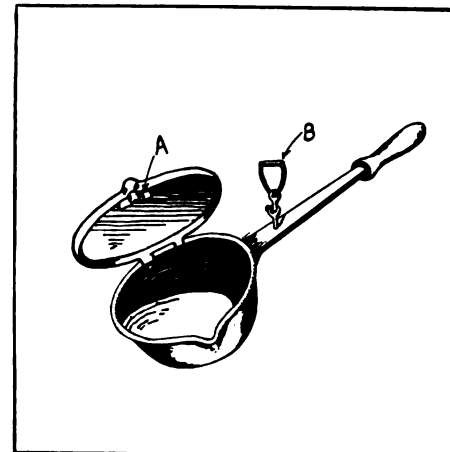
shown at *A*, by hammering the ends together, which cannot be done, try kink *B*.

This produces a cotter of the shape shown at *C*, which can easily be re-entered. You may think this is so self-evident and in every-day use that it is foolish to mention it. Nevertheless, I have seen many mechanics pounding away trying to straighten a cotter-pin and so I am passing this along for what it is worth.—C. H. W., N. H.

* * *

Handy Ladle.

When pouring babbitt considerable difficulty sometimes is experienced in trying to prevent the scum from pouring with the metal. To prevent this, a rake is fastened



Making the Ladle Convenient.

to the lid as shown in the illustration at *A*.

The handle, *B*, can also be made from some odd parts around the repair shop and will greatly facilitate the pouring of babbitt.—M. P. B., N. Y.

Giving the Tourist Road Information

Did You Experience Any Trouble in Giving Reliable Road Information Last Summer?—Spring Will Find You Too Busy—Now Is the Time—Simple and Inexpensive Method Which Gives the Kind of Information Tourists Want

By C. M. Adams

The man in the gray touring car, who had just bought ten gallons of gasoline, received his change, pocketed it, and then, with one hand on the ignition switch, turned back to the man who officiated at the filling pump. "Can you tell me how to get to Forestdale from here?" he inquired.

The keeper of the tank contemplated a moment. "Well," he began, pointing deliberately down the street, "You just go right ahead out that way 'til you come to the cemetery at the top of the hill and there you take the first turn to the left and go—"

"Say, how do you get that way?" the ever-present bystander leaning comfortably against the garage door, demanded. "Tell him straight. You take the second turn to your left till you come to Jerkinsville and then—"

"Get stuck in the swellest mud in the state," the garageman put in derisively over his shoulder, without looking around, "And drive three miles farther to boot."

"'Taint three miles farther," the bystander defended with heat. "It's only two, and it ain't muddy now, neither. I was over it yesterday and it's—"

The garageman turned on him wrathfully, quite forgetting the buyer of the gasoline. "If I didn't know any more about roads 'round here than you do, I'd go eat a spark plug," he growled. "Anybody that ain't a fool knows—"

The man in the gray touring car, with a sigh of disgust and a muttered something, started his motor and left the two now gesticulating strenu-

ously, to argue it out, and moved on to the corner drug store where a boy eating an ice cream cone told him briefly and single-handedly exactly how to reach Forestdale.

To onlookers, incidents such as this no doubt prove amusing, the degree of entertainment afforded, of course, varying with the vocabulary and argumentative attainments of the principals.

But the owner of an automobile, or

could, would not be kept up to date.

To meet this situation perhaps nothing is simpler or less expensive than a typewritten list of distances and directions for reaching all surrounding local points, framed under glass, and posted in some easily accessible spot.

A board similar to that used for posting bulletins before public buildings and in their corridors may be used and its dimensions carried to any suitable size.

The list need not be typed on a single large sheet of paper. In fact, it will prove more advantageous as well as simpler to type it on several ordinary sized sheets. Then, in case changes have to be made because of the condition of a road or bridge, only one sheet will have to be retyped to make the correction.

Nothing elaborate in the way of description need be attempted. A single, straightforward and accurate setting

forth of the distance to the point, directions for reaching it, and a remark or two concerning any unusual conditions which need be expected along the road, should be included. For example, directions for reaching Forestdale might read: "Forestdale—7.6 miles; go east on Main street to cemetery, first turn to right, third turn to left, and then right where road forks. Must go down steep hill just beyond turn to left. Clay roads."

Particular attention must be given the matter of distances. Even when local wiseacres agree on directions to be taken or the condition of roads to be traversed, they often disagree

(Concluded on page 38)



Gives Road Information to Tourist Only to Have His Directions Disputed.

driver seeking definite information they not only prove annoying, but constitute a disagreeable experience, and yet few automotive merchants take any comprehensive steps to avoid such an occurrence in their establishments.

Road maps, the sort which chart large areas, are to be had in abundance and at little cost. Every automotive merchant has a supply of them. But so has every motorist who does any touring.

The kind of information he wants is the innumerable list of little local things, the dirt roads, the grades, the landmarks, the thousand and one intimate details which a small scale road map cannot include, and if it

Welding, Cutting and Brazing Practice

The Garage Welder Will Soon Have His Hands Full Doctoring Cracked Cylinders—Considerable Time and Material Can Be Saved by Doing Two at One Time—Procedure for Handling This Work Rapidly and Systematically

By David Baxter

Winter, the time of cracked automobile engine cylinders, is now upon us; the garage welder will soon have his hands full doctoring the results of carelessness on the part of automobile owners and drivers. So long as we have cars we will have carelessness, I suppose, and as long as we have carelessness, we will have cracked cylinders.

The automobile driver will leave his car improperly drained, and the water jackets will freeze and crack. So the welder had best get busy and prepare to reap the benefit—or should I say reap the trouble?—for welding automobile engine cylinders is anything but a sinecure, especially when everything is cold and nasty.

When cracked cylinders come into the welding department of a garage, they usually arrive in pairs. It seems to be a favorite trick of winter to freeze both, or all, when he freezes. Sometimes we think he might have let us off with at least one. Perhaps he reasons that we can weld a pair just as easily as one—and so we can. It is the express purpose of meeting such occurrences that this article is written—to take care of the two-fold jobs—for it is not good practice to weld the cylinders one at a time when both can be handled at once.

Considerable time and material can be saved by preheating and welding two cylinder blocks in one fire, and considerable can be saved by making the work of preparing and finishing the castings continuous. That is, both castings are handled as one job through the entire process of repairing. Certain parts of the repairing must be done separately, of course, but this can also be made economical by doing so on both cylinders in succession instead of treating each as a different job. Enough of the work can be combined to justify the term, doubling-up on cylinder welding.

Where the job is a pair of blocks, the welder should prepare both for welding while he has the tools at hand instead of preparing one and welding it, then preparing the other and welding it. This is an item of saving not to be sneered at. Then he should prepare for preheating both. This is another item of saving, because the continuous operation conserves time. The castings should be heated at one time in the same preheating device and by the same fire, occupying but little more space—a big item when crowded for space.

When the cylinders are cooling after welding, they occupy less space and are both done at one time. In fact, I might

go on at some length to prove that the doubling-up procedure is advantageous, but I think the average welder can readily see where it is beneficial if I proceed to describe a cylinder job wherein the castings were repaired together.

Both blocks were cracked as indicated in Fig. 1. The outer wall, or water jacket, of each was cracked on the side for a space of approximately six to ten inches. This made it necessary to weld the castings in a horizontal position, making the job more particular in regard to preheating. In order to distribute the heat equally, the cylinders were heated on end first, then placed

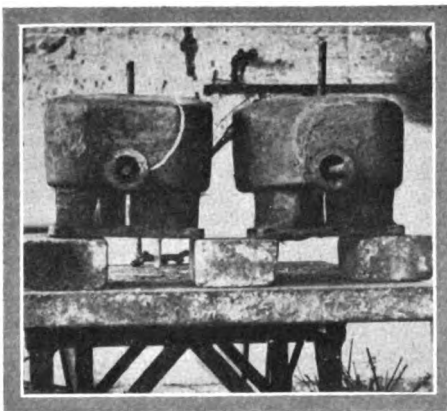


Fig. 1—First Heating Position.

crack up to weld. To do this, the welder must exercise some good judgment lest he overheat the castings, which I will endeavor to make clear later.

The metal thickness of the jacket also made this job a wee bit particular, because it is so easy to push holes through the casting while welding; also it is liable to collapse if too large an area is melted at one time. The welder must be careful in manipulating the flame and filler rod while welding flat surfaces of cast iron as thin as the average automobile cylinder. In this particular case the wall was not over 3/16ths. of an inch thick where the cracks were located.

There are other things besides the metal thickness and location of the cracks with which the welder has to contend when welding automobile cylinders. One of these is the fact that the inner side of the wall is usually crusted with a deposit of lime or other chemicals, due to the action of water upon the metal, and to the constituents of the water. This crust usually causes trouble in the weld by preventing proper fusion, and being at the bottom of the weld is difficult to flux and float to

the surface. If the weld is made to the bottom of the groove as it should be it is hardly possible to avoid melting some of the deposit.

Another objection many welders have to automobile cylinder welding is that they are hard to prepare for welding in relation to cutting a V-groove along the crack. They employ a hammer and chisel and are liable to lengthen the crack by striking too heavily, or perhaps break a piece out of the wall. If they do the grooving with a file, it is slow and tedious. However, the latter is the safer method and for this reason it is recommended.

Some of the devices and procedures given in this article may be changed or altered to suit shop conditions or equipment, but in the main the process may be followed out with success by the average repair welder. So I believe it will be best to take these cylinders from the time they arrived at the shop and follow the work through each part to the completed job, giving in detail the different steps of the repairing as they were done by the welder who did it. This in preference to attempting to dictate just how to do a similar job.

First, the cylinders were prepared for welding by cutting away both sides of the cracks until a V-shaped groove was formed the full length of the cylinders. The grooves extended to the bottom of the cracks and were as wide at the top as the metal thickness, the cutting being done with a heavy square file. Both cylinders were grooved before doing any other part of the preparing; this to save time in handling tools. Then the vicinity of both cracks were filed bright and bare to prevent any foreign substance from entering the weld when the flame was applied. Cleaning both castings saved time by being continuous.

Next, the surface along both cracks was tapped lightly to jar loose any of the scale which might be adhering to the inner side of the jacket. This tapping eliminates much of the trouble due to this source.

The next step in the process of preparation was to coat the bore of all cylinders with a mixture of oil and graphite, then pack them full of scrap asbestos paper. This was for the purpose of preventing the preheating fire from coming in direct contact with the polish of the cylinder bores, thereby blistering or warping them, if overheated. When these preparations were completed, the job was ready for preheating.

Both cylinder blocks were placed bore

downward as indicated in Fig. 1. The flanged ends were rested upon pieces of fire brick spaced to permit a free circulation of the preheating fire. The heat would thus be enabled to pass between and around both castings. In this position both castings were heated red hot before turned upon their sides to weld.

Before heating, however, a brick wall was erected around the cylinders to confine and conserve the heat. This wall was made of bricks laid without mortar to the height of the castings. Several sheets of iron placed over the top enclosed the heat.

This form of preheating oven is cheaply and easily constructed and may be laid aside to use again on numerous different jobs. The walls may be built to conform with the shape of the casting, which is not true of a special preheating oven.

When everything was ready, the first stage of the preheating was started. A common air pressure oil burner served as the heating element and was arranged to spread its flame over the interior of the oven through an aperture left in the brick wall for that purpose. It was permitted to burn slowly at first to prevent any sudden expanding of the castings.

Then the heat was increased until the cylinders were red all over, this condition being easily ascertained by peeping beneath the sheet iron covering. As soon as the castings were red, their position was

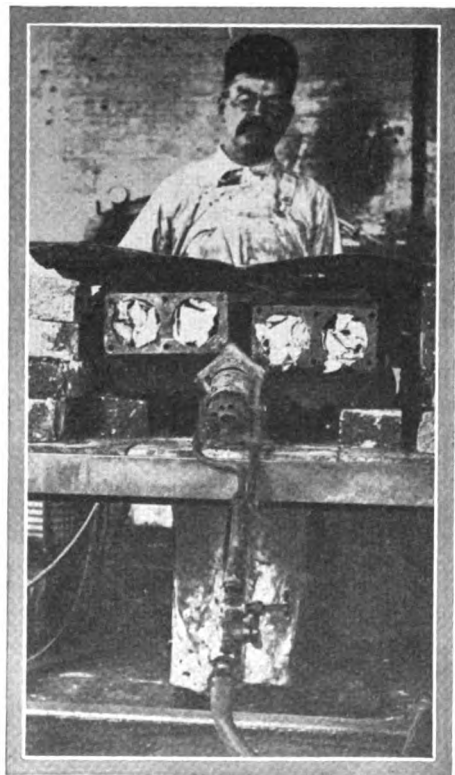


Fig. 2—The Welding Position.

changed to that shown in Fig. 2. In this position the cylinders rested with the crack upward ready to weld. But before starting to weld, the covering was replaced and the jobs allowed to heat a few minutes to

insure against the loss of heat while changing positions.

In Fig. 2 is shown the preheater, also the asbestos packing in the cylinder bores. The brick wall was torn away on the near side of the oven in order to take the photograph.

Probably an explanation of the reasons for preheating such castings should be made here for the benefit of readers who are beginners in the art of welding with the oxy-acetylene torch. The heating previous to welding is for the double purpose of causing the metal to expand so that there will be no sudden strain when the torch flame is applied, and to cause the casting to contract upon cooling in unison with the contracting weld.

If the weld was made in a cold casting, it would contract when it cooled and pull away from the cold metal in the casting, thus causing a crack varying in length and width according to the strength of the contracting weld. By heating the casting, it will be caused to spread, so to speak, and then follow the weld inward when both cool. It should be said also that the heating previous to welding tends to make the metals fuse easier because not so much heat of the torch is required to melt the weld.

When the castings were hot in the second heating position, a part of the sheet iron was drawn back to expose the groove of one cylinder. Sheets of asbestos paper were arranged to protect the operator, then the welding commenced. The flame of a medium size torch was applied to one end of the crack and at the same time a filler rod was brought in contact with the flame. As soon as the groove started to melt, the melting filler rod was twisted in it.

As the groove was filled, the torch and filler were moved to another portion of the groove. The flame was continuously in motion revolving in tiny circles over the groove and end of the filler rod, which was also kept moving by twisting and puddling in the melting weld. It was removed from the weld to apply a quantity of flux to the weld. This was done at frequent intervals to float and consume the dross of the molten metals. Bits of dross that were stubborn were picked out of the weld with the filler rod; the rest was blown aside with the pressure of the flame.

Care was taken at all times to prevent pushing holes through the melting weld. Nor was the filler dipped directly into the weld but passed through the flame before reaching the melting metal. At no time was the melting filler allowed to drip into the weld but was fed beneath the surface.

The entire crack of one cylinder was welded in as near one uninterrupted weld as possible with a surplus metal piled and smoothened along the top. The edges of this surplus were melted into the casting metal and flowed smooth with the torch pressure to lend the whole weld a pleasing appearance. Then the weld was covered again with the sheet iron to reheat while

the welder attacked the other cylinder.

The second crack was melted and fused in a manner similar to the first.

The work on both castings was accomplished as deftly and rapidly as compatible

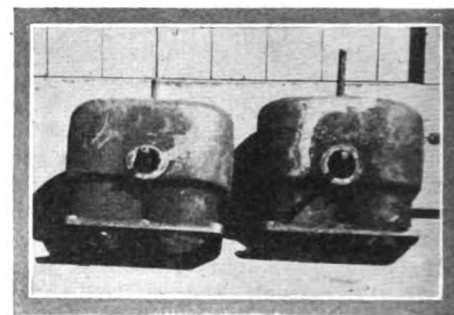


Fig. 3—The Welded Castings.

with good welding practice. A narrow weld on thin work is best made by rapid work, since this prevents heating a large portion of the casting along the weld.

The weld on each cylinder was started at an end farthest from the operator and worked toward him, thus permitting him to keep the finished part of the weld in sight at all times which is a distinct advantage since he can see the moment a defective spot appears and can immediately remedy it. Each pin hole or spongy spot in the weld must be remelted, or it will cause a leak when the cylinder is put back in service.

Where the welder welds away from himself, he is handicapped by not being able to have a clear view of the weld at all times. The torch and filler rod obscure, or at least confuse, the view so that he may easily overlook small defects. In such a case he must go back afterward and re-open a set weld in order to remove a recalcitrant bit of slag.

The choice of ends for commencing to weld did not make material difference so far as the better job was concerned. The flame might as well have been applied first at either end of the crack, except for convenience to the operator, as previously stated, and the weld could have no influence upon the expansion and contraction except as stated above, since neither end of the crack was free or ended openly.

Before closing this discussion of the methods of welding, it might be well to insert an explanation of the reasons for two preheating positions. The castings were first heated on end, then placed on the side and heated again before welding.

This was perhaps not entirely essential to a satisfactory weld but in theory it was correct and could do no harm if the welder was careful about regulating the preheating flame. The theory is that the lower side would receive most of the heat from the preheater and therefore tend to overheat if the whole heating was done in the side position. On the other hand, if heated on end a while the shape of the cylinders would permit an even distribution of the heat.

(Concluded on page 36.)

Readers' Questions and Answers

Conducted by E. C. Pohlmann

Bearing Adjustment.

I have been experiencing difficulty in properly adjusting the wheel bearings of a car belonging to one of my customers. The bearing in question is a Timken cone-type roller bearing. I would like very much if you would advise how the Timken bearings should be adjusted. S. L., Ill.

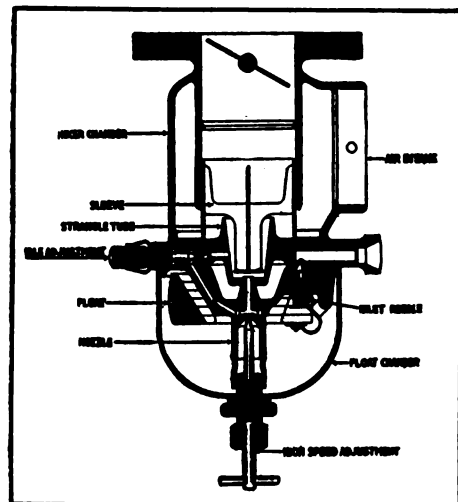
To adjust a Timken bearing you should turn the bearing tight and revolve the wheel several times by hand, overcoming a possible tendency to backlash. You will note an adjusting nut, which should be backed off very slightly so that you will feel a slight shake in the wheel when grasping two opposite spokes in a perpendicular line—one above and one below the hub.

You may find that this will result in a shake in the wheel which is more than barely perceptible, and if so, it is too much, and the adjusting nut must be tightened just a little. Repeat this process until it is just right, then lock it. The bearing should then give excellent service.

* * *

Engine Misses.

I have experienced considerable trouble in adjusting the carburetor on a Maxwell touring car, 1918. It runs very nicely



Maxwell Carburetor, Showing Adjustments.

when the car is at a standstill, but when the car is started up, it chocks and misses. I have tried every possible adjustment, but cannot succeed in making the motor run right. Will you please explain how this trouble can be overcome?—E. G., Va.

The trouble is due to a weak mixture which is all right when the engine is under no load, that is, when car is at a standstill, but is too weak when the car is started. The weak mixture is most likely the result

Get into the habit of asking questions! The more you ask about your business the more you will know, and the more you know the more money you can make. Do not hesitate to send in your questions, whether you are a dealer, a salesman, a mechanic, a service man, or a stockkeeper, they will be gladly answered.

Perhaps there is something you want to know about a certain car or truck or the specifications of some particular tractor or how to store repair parts, or increase the efficiency of your repair shop. We welcome queries about anything and everything connected with the automotive industry. When a quick answer is desired we will send a reply by mail, otherwise the answer will be printed in this department.

of air leaks around the sparkplugs, especially if these were taken out for the purpose of cleaning, or leaks around the intake manifold flanges.

It may be due to an obstruction in the carburetor needle valve, a piece of dirt or lint, or an obstruction in the intake manifold. The poor operation may not be the fault of the carburetor, but may be due to some trouble in the ignition system. Make sure that it is not caused by air leaks or faulty ignition before proceeding to adjust the carburetor.

To adjust the carburetor, start the engine and let it run until the motor gets warmed up to service conditions. Then place the spark lever in fully retarded position and open throttle until engine runs at average operating conditions. Next turn high speed needle in bottom (see illustration) to right until engine speed decreases from a lean mixture. Then turn to the left until the engine speed increases and again slows up. This is as rich a mixture as can be obtained.

By turning again to the right to a point half-way between the two when the engine speed is highest, the correct mixture for general driving will be obtained.

Adjust the throttle-lever stop screw until the desired idling speed is secured. Should the engine fire unevenly, turn the idle screw to the left to enrich the mixture or to the right for a leaner mixture. The idle screw should be about one-half way out. The idling adjustment should be made with spark and throttle fully in retarded position.

* * *

Washing New Cars

Is there any special method that should be followed in washing and dusting a new car, or one that is newly painted? I will appreciate any suggestions along this line?—M. T., Ore.

It is an easy matter to permanently

damage the paint of a new automobile unless care is taken in the process of dusting and washing. On a newly-painted car, the paint should have plenty of chance to set before any attempt is made to even dust it. This will be found especially true at this time, when cars are rushed from the factory to the owner in the quickest time possible. The dusting of a car under these conditions is apt to leave scratches, which can in no way be removed. The best way to preserve the paint on a new car is not to dust it thoroughly for a few weeks. During this period

when the car becomes dusty, wash it off with a stream of cold water, being careful that there is very little force back of it. Also be sure that the body is cool.

In other words, it is far better not to rub the body at all, but remove the dirt as suggested with water, drying the car with a chamois that has been dampened. After cleaning in this way three or four times, the car will stand dusting. For this purpose, use cheese cloth which has been lightly oiled.

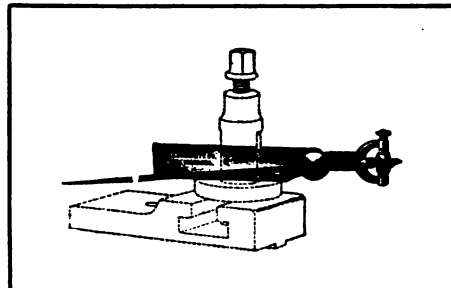
Never, under any circumstances, wash a newly-painted car while the engine is hot, or the car is warm from exposure to the sun, as there is nothing that will dull the finish quicker.

* * *

Center-Testing Instrument.

Is there any kind of an instrument which you can buy for testing centers?—J. J., Mo.

An instrument called a center tester is used for this purpose. It can be purchased



The Centering Tool.

from any tool manufacturer or machinist's supply house.

This instrument, as shown in the illustration, was designed to be used in adjusting and locating centrally any point or hole in a piece of work operated upon in a lathe chuck, or on a face-plate; also to test the truth of lathe centers or a shaft between the centers, the instrument being held in the tool post.

The indicating needle passes through the

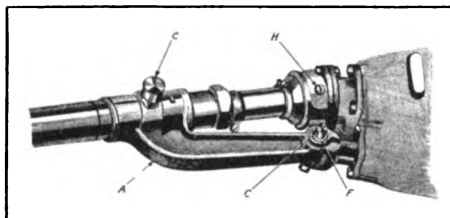
ball, having a split stem, forming a chuck for holding the needle adjusted to any desired length.

The ball is pivoted to form a universal joint, but may be instantly converted into a single joint for tilting motion by only tightening the knurled nut, and thereby adapting it for both inside and outside surface contact.

* * *

Torque Arm.

What is the purpose of the arm at the universal joint on the 1915 King? I noticed this for the first time about a week



Torque Arm on King.

ago when I made some repairs to the universal joint. What attention should this torque arm receive?—J. H., Md.

The arm at the universal joint on the 1915 King is the torque arm. The rotating motion of the gears produces a reaction in the opposite direction. Besides this there is a force acting on the frame of the car which moves it forward.

On some cars these forces are taken care of by means of radius rods or a torque rod, or as in the case of the King and a few others, by means of a torque arm fastened to the transmission case and the universal shaft.

Many of the lighter cars do away with radius rods and torque rods or arms by using stronger springs and fastening them so that the forces are transmitted through them. This is known as the Hotchkiss drive.

The torque arm or yoke, A, in the illustration plays a very important part in the driving of the car and therefore should be given periodic attention and lubrication.

The moving parts should be lubricated every 300 miles. The grease cup marked C should be filled three or four times and the cup screwed down as far as possible each time. This same practice should be followed when lubricating the torque-arm pin, F, by means of grease cup G. The plug, H, in the universal joint housing should be removed for filling the joint with heavy oil or grease every 1,000 miles.

When the moving parts of this arm wear, you will notice a knocking when riding over bumps and also when accelerating. This can be overcome by reboring and using larger pins.

* * *

Care of Governor.

1. Please explain what attention the governor on the Nash one-ton truck should receive.

2. What is the horsepower rating of the Nash one-ton truck according to the S. A. E. formula?

3. What is the horsepower rating of the Nash "Quad" truck according to the S. A. E. formula?—J. B., R. I.

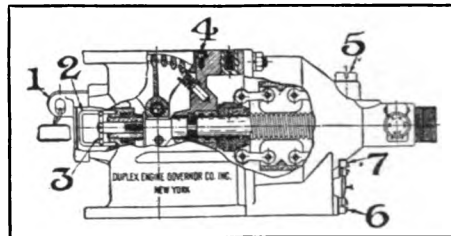
1. To clean the governor valve, pour kerosene into air inlet of carburetor while engine is running, varying the speed of the engine from high to low, thus opening and closing the valve. Every week remove the screw marked, 5, and fill the chamber with medium heavy cylinder oil during the summer and in winter add to it an equal amount of light machine oil.

Every 1,000 miles remove the drain screw marked, 6, and fill half full of very light machine oil, run for ten minutes to clean interior, then drain and refill chamber half full.

Never run governor without oil; it will injure the bearings. Keep screws, 6, and 3, tight to prevent oil leakage. It is best to connect them with a wire to prevent losing them.

The action of the governor also gives a fair indication of the condition of the engine. If it surges, it may result from one of five causes: The mixture is too rich; governor lubrication is bad; the ignition is faulty; dirty governor valve; or the cable drive is not steady and free from backlash.

Never make any adjustments to the governor without first getting the consent of the factory. For higher speed turn hand wheel 3, out for higher and in for lower speeds. Do not fail to lock the hand wheel with the yoke, 2, after setting, if a locking spring is not provided, and see that



Governor on Nash Truck.

the yoke does not bind on the hand wheel. The locking pin and seal, 1, are for the protection of the governor and engine. Do not touch the valve screws, 4.

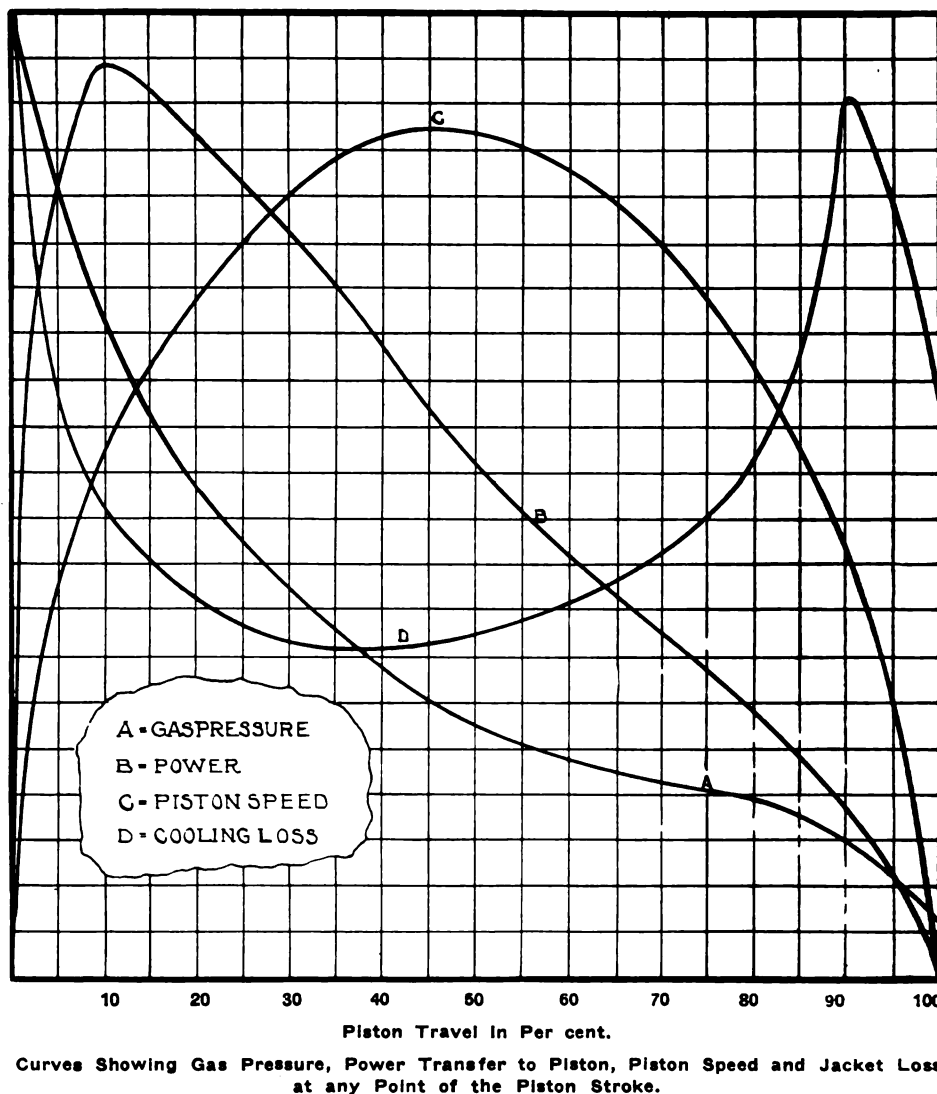
2. The S. A. E. rating is 22.5 horsepower.

3. The S. A. E. rating is 28.0 horsepower.

* * *

Water Injection.

Will you explain the design and operation of the Rumely tractor, and in addition explain why engines operating on kerosene



as a fuel knock more readily and must have water injected? I don't understand how water prevents this knocking.

Why doesn't this same knocking occur in automobile engines? That is, knocking does occur; but why doesn't it occur as often as in engines operating on kerosene? Besides, how do you account for the better operation and increased economy of engine when water is injected with the charge?—R. C., Va.

The Rumely tractor is made by the Advance-Rumely Thresher Co., La Porte, Ind. It makes different size tractors, but in all of these the design and operation is very much the same.

The engine is of the company's own design, horizontal, four-cycle and uses kerosene for operation. On all its models force-feed, splash lubrication and a circulating pump cooling system are employed. The engine is equipped with an air cleaner and the Secor-Higgins carburetor. A sectional view is shown in the accompanying drawing.

The operation of the Rumely tractor does not differ much from that of any other tractor and the general precautions apply.

Kerosene always produces greater heating of the engine and, moreover, kerosene vapor-air mixture ignites at a lower temperature than gasoline vapor-air mixture. For gasoline, the ignition temperature is 680° Fahrenheit and only 575° Fahrenheit for kerosene. Of course, these temperatures will vary for different fuels, but on the average are representative values.

Because of their difference in ignition temperatures, the compression ratios used in gasoline engines would invariably lead to pre-ignition in kerosene engines. There-

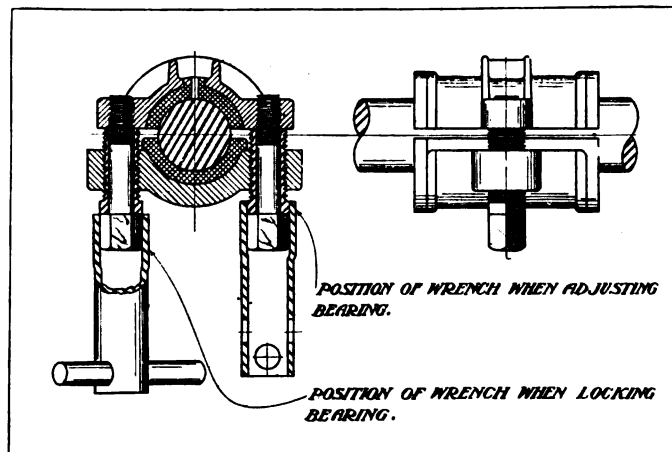
decrease the thermal efficiency and consequently manufacturers of kerosene engines resort to water injection to keep down the temperature of ignition.

P. M. Heldt, writing in *Automotive Industries* (Dec. 20, 1918), gives a very good explanation of the effects of water injection.

He says that water enters in a liquid state and very finely divided or in the form of a very fine spray (as in the case of the Rumely tractor). During compression it absorbs some of the heat which is generated by the compression of the charge, to make up its latent heat, that is, to change the water to steam, and the charge, therefore, will not attain the same temperature at the end of compression as it would if no water were present and pre-ignition (the cause of knocking) is prevented.

The knocking in an automobile engine does not occur if the cylinders are free from carbon, because the compression ratio is correct for the ignition temperature of the fuel used. When the cylinders become carbonized, the compression ratio is increased and hence pre-ignition takes place. If water is injected, the ignition temperature is lowered, knocking does not occur and the engine operates smoother.

ter itself cannot furnish directly any mechanical energy to the engine, because it is found in the gaseous state in the exhaust and in a finely-divided state of water in the charge and, therefore, has a greater



Positions of Socket Wrench for Adjusting Reo Bearings.

amount of potential energy when leaving the engine than when entering it."

Therefore, the effect of water can only be indirect and through its effect on the thermal efficiency of the engine.

Consulting the curves shown on the following page, it is seen that the amount of heat given up to the cooling water is greatest during the first part of the power stroke when temperature is highest and then reaches a minimum towards the center of the stroke and again of considerable value toward the end of the stroke as the wall area becomes a maximum.

The piston speed becomes a maximum just before the middle of the stroke while the pressure and power are greatest at the beginning of the stroke.

It is seen from the curves that if we can transfer some of the heat liberated during the first part of the stroke, to the middle of the stroke, we will reduce the jacket losses and increase the thermal efficiency, thereby increasing the power transferred and increasing the economy. And that is what water injection does.

During compression, some or all of the water is vaporized and on explosion the remainder, if any, is converted into steam and then all of it is superheated under high pressure. It, therefore, absorbs energy of combustion during the first part of stroke and gives it out later in the stroke.

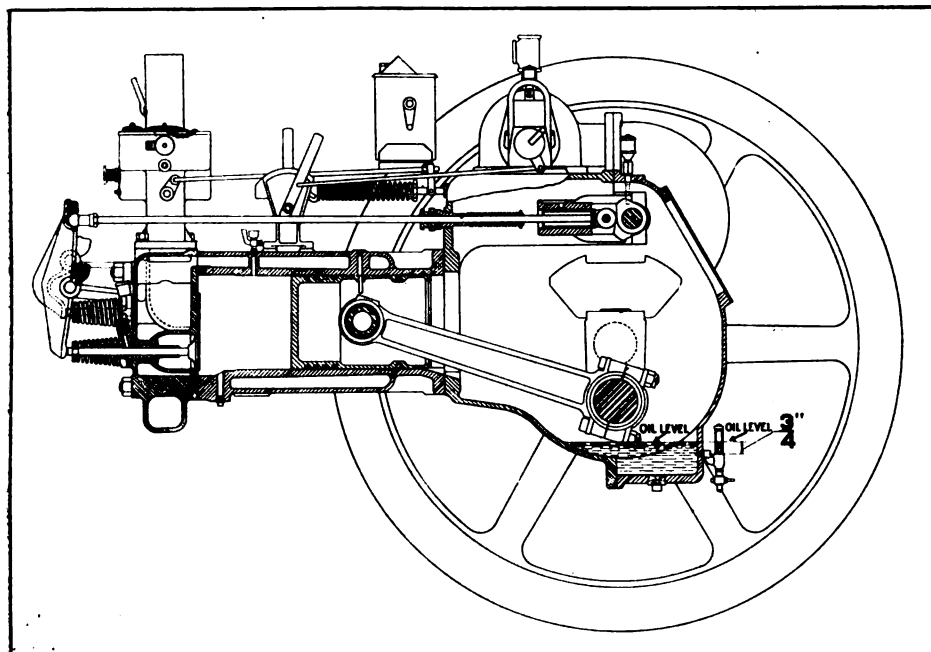
* * *

Adjusting Bearings.

Please give me the correct method of adjusting the bearings on a 1915 Reo, six-cylinder, touring car.—M. W., Wash.

The two end crankshaft bearings can be best adjusted by removing the under pan from the chassis frame. Then with socket wrench unlock these bolts by turning to the left. Now slip the wrench down over the threaded spacing sleeve and adjust the bearing caps up or down as may be required.

By referring to the illustration, the two



Cross Section of Rumely Oil-Pull Tractor.

fore, kerosene engines must be designed with a smaller compression ratio or the temperature of the charge just before ignition must be kept down by water injection.

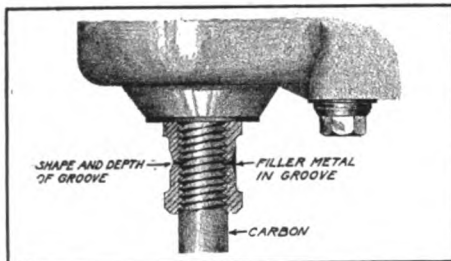
To decrease the compression ratio would

Tests show increased fuel economy and smoother operation when water is injected with the charge and writers have been at a loss to explain this phenomenon.

"Certain it is," says Mr. Heldt, "that wa-

positions of the socket wrench will be understood and also the spacing sleeves which replace the usual shims.

If the bearings require only a slight adjustment, carefully turn the spacing sleeve to the left about one-half turn, then lower-



Method of Brazing Carburetor Neck.

ing the socket wrench to the locking bolts, turn to the right and lock as tight as possible.

Now turn the crankshaft; if it turns hard, unlock and turn spacing sleeve to right slightly, lock the bearing and try the crankshaft.

Care should be taken to adjust each side or spacing sleeve the same amount on any one bearing or otherwise the bearing will be thrown out of line. To make certain of this, mark each sleeve with a piece of chalk before it is disturbed so that the amount of take-up can be seen when the final adjustment is made.

The connecting-rod bearings are adjusted through the hand hole cover on crankcase. In order to detect play in the rods, turn the engine so that the connecting rod is in a vertical position and then pull vigorously back and forth on the rod in the direction of the length of the motor. If there is play, remove the thinnest shim and lock bolt as tight as possible.

Do not adjust bearings so close that the shaft turns hard, as a slight amount of play is necessary to take care of expansion. The shims should be removed one at a time until the rod shows absolutely no play and then one of the thin liners should be added to give the desired play.

* * *

A Difficult Brazing Job.

While tightening the gasolene line to the Zenith carburetor which is installed on the 1914 Hudson 6-54, I broke the part over which the filter screen fits and to which the union body is fastened. This is part of the carburetor body.

I tried soldering it, but it would not hold and unless I can fix it I will have to buy a new carburetor. Can it be welded or brazed?—M. P., Del.

The cracked part can be welded, or more properly speaking, it can be brazed with the acetylene welding torch. But it takes nerve to tackle such a job and it takes steady nerves to accomplish the work. Once it is started, it must be finished without stopping, and the least wobbling or miscalculation will probably ruin the thing beyond repair. In other words, the torch operator must be skillful, besides knowing

how to handle the torch. This is not intended to be discouraging, but is merely a warning.

To do the brazing, first remove all loose parts, screw, union body, valve stem, etc. Then clean the neck wherein the crack is located; remove all grease, oil or sediment that may be on this neck in the vicinity of the fracture; wash it well with gasolene and wipe dry with a cloth. Then with a sharp three-cornered file, cut a groove the full length of the crack. Make this groove wide, but not deep. Do not cut deep enough to reach the threads. You may cut close to the threads, but not into them. If the neck is broken off entirely, the groove can be filed with the screw in place to hold the broken parts. If it is merely cracked, the work is simpler. The screw should be removed before brazing, however.

In event of the part being broken in two, some arrangement should be made to hold it together while brazing, and to preserve the threads on the inside of it. A handy device for this purpose is a piece of round carbon a fraction larger than the hole through the neck. Fit the carbon into the opening and turn it round and round until threads are cut in it to correspond with those of the neck. This is a rather slow process, but is worth the time, since it will protect the threads as well as hold the break together.

After these arrangements are made, some way must be devised to turn the carburetor evenly and steadily while the brazing metal is being applied. This can be done by inserting the carbon into the hole of a flat piece of iron which has been fastened in a vise, providing the carbon is long enough. The carbon should fit the hole snug enough so that a slight pressure will revolve the neck. The revolving should be away from the torch operator during the brazing so that he may see the progress of the work.

You are now ready for the torch, which should be a small one fitted with a small tip, say a No. 2 for a Torchweld torch. Light the torch and regulate the flame to a strictly neutral, unless you are an expert, then you may employ a slight excess of acetylene in the flame. Watch the flame and keep it the same during the entire process of brazing. When the flame is burning with a steady neutral flame, bring it close to the spot in the groove where the brazing is to start. At the same time bring a filler wire of Tobin bronze close to the flame, so that both will commence heating. The filler wire should not be over one-eighth of an inch in diameter.

Watch the groove closely and as soon as it starts to melt, add the filler. Do not melt the filler before the groove is ready to receive it, and do not melt the groove very deeply. In other words, do not melt more than a very thin skin of the groove surface—just enough for the bronze filler to adhere. Keep the flame constantly in motion to prevent overmelting the groove.

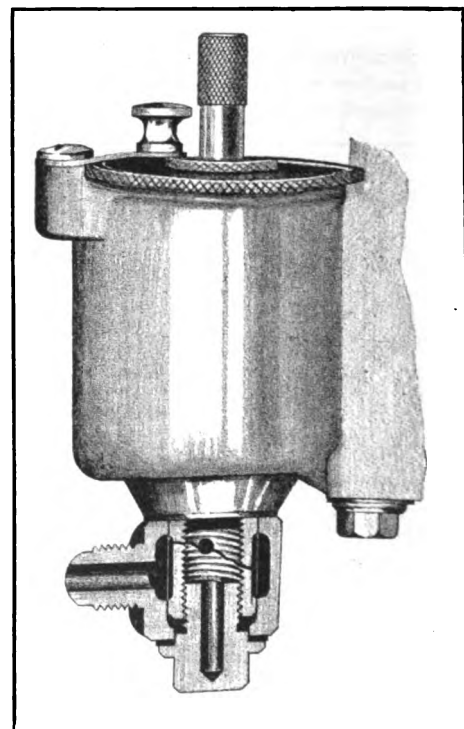
Add the filler just as soon as the thin

skin is melted. Try to have the filler, flame and melting groove work in unison. Get the full surface of the groove ready to receive the filler, then melt it on as soon as possible. Keep working steadily onward as fast as the groove is filled, turning the carburetor over as it is done. Braze the entire crack without stopping if possible.

During the process a liberal supply of brazing flux should be applied to the groove by dipping the melting end of the filler wire in a pot of it, always returning it quickly to the braise. And as the filler metal is added, do not try to make a smooth, flat joint, unless you are an expert. Better put the metal on in little waves, but be sure each one is connected to the preceding one. Leave a surplus of filler along the groove, which may be machined off afterward, since it should make a stronger bond.

The gas inlet will probably be destroyed, and it is better not to try to save it, but to weld it full and drill it afterward. The threads on the inside of the neck will more than likely have to be rethreaded when the piece is brazed, and it may be necessary to grind the end of the neck to make a tight joint with the union body. If all of the solder you tried first is not cleaned off of the crack, it may cause trouble in making the brazing adhere. When cleaning and grooving the fracture, be sure that this is all removed.

We hope we have answered your question definitely enough for you to do the



Zenith Carburetor Showing Broken Neck.

work and that you make a successful job of it. If we could see the casting, or you could give a more detailed description, we could probably help you more. By referring to the accompanying drawings in connection with the instructions, you should be able to make the necessary repair.

How to Make the Shop Profitable

A Continuation of Investigation Tour Shows that Sales Agencies Are Interested in Selling Cars—Repairmen Not Willing to Inform Owner Concerning Condition of Car—Shop Rules Very Rigid—Work Turned Out on Time

By E. B. Hinrichsen

Through the kindness of the manager of the service department they were visiting, Bill and Mr. Brown were able to borrow a used car of a popular make from the second-hand car department. They drove down the boulevard a few blocks to the agency which handled this car. Here they stopped and Mr. Brown went in to find out where the service station was. The showroom was large, well-lighted, and was rather richly decorated. It was crowded to such an extent with display cars that a possible good effect was lost.

The salesman who talked to Mr. Brown was courteous and directed him to an entrance on a side street. They drove inside among a number of other cars, but found no attendant. After looking around for a few minutes, they saw a sign back in a corner which read "Service Office." It was necessary to crowd between several cars to reach this place, but after an effort, they found themselves in a well-lighted, attractively-arranged combination outer office and accessory salesroom.

It was small, but did not have the appearance of being crowded. There was a fairly complete stock of accessories on one side, well arranged and displayed. The show-cases were spotless and the stock clean. A good rug covered the floor and in the center was a table and several easy chairs. A glass partition ran across the room on the side opposite the accessories, behind which were a young chap and two girls. The girls were operating typewriters, evidently billing, and the young man was industriously engaged in doing nothing. On the door in this partition was lettered "Superintendent. No Admission." Bill stuck his head through a window.

"Can I get someone to look at my car?" he inquired.

"Where is your car?" asked the gentleman of leisure.

After being informed that it was out in the garage, his next question concerned the nature of the trouble. Bill said he did not know what was the matter with it.

With a sigh and the air of a martyr the young man arose from his chair and accompanied them to the car. He looked it over very carefully from the outside and announced himself willing to make a test if they would run the car out into the

street. Bill started to back it out, but was stopped by a doorman, who demanded a pass. Bill did not have any and the man refused to let him out, giving as his reason that he had not seen the car come in.

The argument began to grow heated when it was interrupted by a long, lank, solemn individual who announced that he was the service manager and would settle the case. After hearing both sides, he

"Be ready about four o'clock. Cost you twenty-two-fifty," was the reply. And there was such an air of finality about it that for the moment they were unable to protest.

They drifted out and finally located the solemn service manager and humbly asked permission to go up to the shop and see the work done on their car. At first it was "impossible," then it was "against the rules," but at last they were told to go to the third floor. A small elevator started

with them, but when Mr. Brown called "Three," the operator demanded a pass. They had none, but stated they had received permission from the service manager to visit the shop. This made no difference to the elevator operator, who refused to take them to the third floor.

They again sought out the service manager, who informed them that they should have gone to the sales manager for their pass. "Misdemeanor number two" from his attitude and mingled with it an indication of pity for persons so ignorant as not to know this.

The sales manager was accessible and affable, but froze somewhat when he learned they did not wish to purchase a car, but only wanted a pass to the shop. He finally gave it to them, and armed with this, they persuaded the elevator operator to let them off at the third floor.

The shop was a busy place. Workmen were falling over each other and all seemed trying to do the same thing at once. They were bossed by a burly foreman whose every other word was a curse and

who promptly ordered them out as soon as he saw them. He would listen to nothing and it was with difficulty that Mr. Brown prevented Bill from mixing with him.

They left the place and dropped into a tire establishment which displayed placards advertising tires at unusually low prices. They learned that these tires were "seconds," rejected at the factories on account of superficial defects and should give as good service as new ones, but were not guaranteed. Bill picked out a good-looking one of the proper size for his car and purchased it.

At four o'clock they returned to the service station. Their car was ready for them, but no information as to what had been done to it. They signed a "Satisfactory Job" slip, paid their bill, received a pass

Be a Mechanic!

Are you willing to say you cannot do what is being done by others? Are you willing that others should outrun you in your game of life? Then be a mechanic, not a machine. Do each task with a determination to do it better than the last one. Do each new repair job with the application of the best you have.

Remember that each job is different, has its own peculiarities of condition or design. Study the principles of gas engine operation; know what conditions exist, what is required.

Water never rises higher than its head or its fountain; so, neither will an engine run better than your aim or ambition in repairing it. If you are every day indifferent in doing that overhauling, it will be reflected in the disgust and dissatisfaction of your customer and eventually in your profit account.

Don't do similar tasks differently each time. Have fixed and definite methods of attacking similar jobs. Study those methods. Study the methods of others. Improve your methods with each application and thus acquire speed, precision, dependability.

gravely gave his permission for the car to go out, but indicated by his manner that it was most irregular and that they had in some way been guilty of a misdemeanor, if not a crime.

Once in the street, the young man proceeded to test the engine by racing it with the cutout open, grinding the gears by shifting without throwing the clutch clear out and finally tearing around a few blocks at the fastest rate possible in the traffic.

After all this, he drove inside, put the car on the elevator, which immediately ascended, and then retired to his office and easy chair without saying a word. Bill and Mr. Brown followed him into the office.

"What was the matter with it?" asked Mr. Brown, for Bill seemed unable to speak.

and then were not permitted to go out by the doorman because the tire Bill had purchased was in the car.

For the last time they appealed to the service manager. He heard their story and told the doorman to let them out, but by this time they were hardened criminals, in his opinion.

Before they had gone a block, Bill pulled up to the curb and began to laugh. He laughed until Mr. Brown thought he would never stop. It was no laughing matter to him. Bill had hung back and let him pay the account.

(To be continued.)

Welding Cast-Iron Cylinders.

(Concluded from page 30.)

The heating time would thus be cut down so that the lower side would not be hot so long while welding the upper side. When the jobs were placed on side to weld, the welding flame would balance the preheater and do away with unequal expansion; the welding flame above and the preheater below would tend to keep the expansion even through the whole job.

In this way also, the overheating could be better avoided, for at no time should the cylinders be allowed to reach a white hot or even a very bright red heat. In event of their doing so, the castings are liable to distort and possibly to enlarge. The metal is also weakened by overheating, being converted into a brittle, lifeless mass if the overheating is long continued.

After the weld was completed on the second cylinder, it was covered again with sheet iron; also some sheets of asbestos paper were spread over the top of the brick oven to further prevent the heat from escaping, the idea being to cause the cylinders to cool slowly. The heat confined within the oven tends to cause the castings to reach their normal temperature evenly.

The cylinders were allowed to remain under cover for an hour or more before removal. The preheater was allowed to burn several minutes after covering to equalize the expansion. When the metal would no longer hiss spit, they were cool enough.

The thoughtful reader should now be able to see where the saving is effected by doubling up on this class of welding.

Tungsten Mfg. Co. Files Brief Setting Forth Trade Policy.

The Federal Trade Commission has served complaint against the Tungsten Mfg. Co. of Marshalltown, Iowa, alleging unfair competition and restraint of trade because of this company's policy in maintaining resale prices, and in one or two instances, refusing to sell the jobber who continued to disregard resale schedule. It also is alleged that this policy was detrimental to other manufacturers, whose policy is to allow open competition.

The Tungsten Mfg. Co. has filed a brief, setting forth its trade policy and maintaining that it has the right and has refused to sell any jobber who will not maintain a reasonable resale price.

"We believe," say the manufacturers, "that this is a very vital subject to the dealer because it simply means that one dealer is buying the same merchandise at a much lower price than another, and is therefore able to undersell him; that the big mail-order and cut-rate houses would be able, under this decision, to practically force the manufacturer to sell them, and through their sales method sell at a price which the average dealers would be unable to meet."

"We believe, that our policy in this matter is absolutely fair, especially to the small dealers, and we intend to fight this case out to the very best of our ability."

Honolulu Plant Pointed Out as a Model for Motor Institutions.

Not far from the famed "Beach of Waikiki" in Honolulu is an automobile concern which is being pointed out as a model for motor institutions of the most progressive American cities.

The methods of the company are said to be of a most enterprising character. Besides having all of the up-to-date equipment for cleaning the interior and exterior of cars, a feature of its service is a squad of "duster boys" who see to it that every car that leaves the service station is absolutely clean. Another innovation is an all-night service club.

New Slogan Brings Trade to Los Angeles Repair Experts.

"Finish the job right" is the slogan which brought 10,000 repair jobs to Barnard & Teaboldt, a Los Angeles firm which specializes in Dodge car repairing.

So satisfactory did the work of these repairmen become that a new and much larger shop was opened in order that the proper care might be given to the ever-increasing trade.

Bacon Motors Corp. Organized to Manufacture Light-Six Cars.

Frederick C. Van Derhoof has resigned as general manager of the automobile department of the Standard Steel Car Co., of Pittsburgh, manufacturers of the Standard "8," and announces the formation of the Bacon Motors Corp., of New Castle, Pa., of which he is president, for the building of a light six, moderately-priced car, which will be ready to market early in the spring.

The officers and principal stockholders of the new concern are all men of large business experience and means, connected with leading business interests in Pittsburgh, New Castle and other cities. The officers are: Frederick Van Derhoof, of Butler,

Pa., president; F. W. Bacon, of New Castle, vice-president; George N. Glass, of Pittsburgh, secretary and treasurer, who with the following comprise the board of directors: D. W. McNaugher, C. D. Scully, W. E. Provost and Edwin N. Ohl, all of Pittsburgh. E. C. Hopkins, of New Castle is assistant secretary and treasurer, and H. L. Archey, of Philadelphia is sales manager.

The new concern has purchased outright at New Castle, a 21-acre factory site, including an absolutely new automobile factory building, 500 ft. long by 100 ft. wide of thoroughly modern construction, capable of turning out 50 cars a day.

Boyce Forms New Fire Extinguisher Corporation.

Harrison H. Boyce of the Moto-Meter Co., Inc., Long Island City, N. Y., has formed a new company the name of which will be the "Boyce-Veeder Corp." for the marketing of an automatic and hand-operating fire extinguisher especially applicable to motor cars, trucks, tractors, aeroplanes, and other automotive vehicles. Its factory and office will be located in Long Island City.

The new company will operate under the "Erwin" patents, and the device is said to be of a very novel and most meritorious nature.

Associated with Mr. Boyce will be Paul L. Veeder, an attorney well known in both New York and Chicago.

Accounting.

(Concluded from page 21.)

charged to Petty Cash and Petty Cash credited with each separate item of expenditure.

Smith gets advance \$1.50 on wages: Credit Petty Cash \$1.50; charge Pay Roll \$1.50. Ink and paper, \$1.15: Credit Petty Cash \$1.15; debit office supplies \$1.15.

Cigars for customers, \$2.25: Credit Petty Cash \$2.25; debit Sales Expense, cigars \$2.25. Red Cross subscription, \$1; credit Petty Cash \$1; debit General Expense, donations \$1.

Your net investment should be carried in an account called Investment, or better, Net Worth. Your Profit and Loss should be accumulated from month to month in a Profit and Loss account which is posted to Net Worth at the end of the year.

Each partner should have a personal account in the ledger to which is charged his withdrawals during the year and to which is credited his share of the divided profits. In this way the Profit and Loss or Net Worth, if it includes accrued Profits and Losses, can always be readily divided according to original agreement. This method simplifies the compiling of your income tax returns. It is never good accounting practice to close Profit and Loss monthly. It is unnecessary.

"Keeping the Automobile Sold"

Regard Every Man Who Buys a Car from You as a Prospect for Another Car—Make Every Owner a Booster, and Every Car a Demonstrator, and You'll Have to Call in a Lawyer to Help You with the Income Tax

By C. L. Funnell

"Keeping the goods sold" is the way some dealers refer to the practice of keeping in close touch with every customer after the sale is made. In the case of the motor car, this practice is of particular importance, for the average purchaser of the gasoline vehicle has little or no knowledge of the fundamentals of what makes it go, and what should be expected from it in the way of smooth operation and efficient performance.

The first job of the dealer after the contract has been signed is, of course, to give the purchaser thorough instruction in driving. And no small amount of good-will for the agency and the car it handles will depend upon how carefully the new owner is taught.

The man who learns to make driving an easy, smooth, quiet process is the best sort of boost for the machine he handles, and conversely, about the worst "ad" a dealer may have is a driver-owner who rasps gears at every shift, and who makes hard work of hill climbing.

For the first two weeks it pays to keep a close eye on the new car. See that the oil level is where it should be, and that the engine gets wiped off at least one-tenth as often as the hood and fenders. The beauty of a handy oil can, with a thumb plunger for dropping a bit of oil on brake-rod joints, should be shown together with the trick of wiping off excess oil with a piece of waste to prevent dust collection.

There are dozens of little things along this line which will get the new owner interested in giving his car the right sort of care, and which will react to the dealer's material benefit.

There is business to be found in

helping to fit up the new garage, too. It is surprisingly easy to sell a man a small electric tire pump for his garage.

There's a dealer in the Middle West who makes a point of selling a com-

Don't expect that you can succeed in making sales to the other fellow unless YOU CAN MAKE HIM SEE WHAT YOU SEE, and to make him see what you see, you've got TO KNOW with clear-cut definiteness, exactly the points you wish to emphasize. About ninety per cent of lost sales are due to the fact that the salesman has no clear-cut ideas of his own, or definite method of presentation. The result is that he and the customer are usually talking about different things, and so the customer isn't convinced.

plete equipment for the home garage. His outfit includes an electric tire pump, a small rectifier for charging storage batteries, a vise, and a neat set of tools mounted on a board to hang up over the bench. A vulcanizer is also a logical thing to install, and properly used will save the owner considerable money in the course of a year.

"I regard every man who ever bought a car from me as a prospect for another car," says an Amsterdam, N. Y., dealer. "As long as he drives the car I sell, he has my interest in how that car is running, how he can get the maximum service from it and what grade of oil, tires, rim wrenches or top dressing he ought to use on it."

That particular dealer lives up to his word, too. A man who bought a car from him three years ago told the writer that he was driving along the street recently with his motor missing a little. It was a cool morning and the owner knew she'd hit on all six when she got warmed up.

The dealer was just coming out of the bank as the missing car passed.

"Hey!" yelled the dealer. "Drive that car into my garage and let Bill

touch up that carburetor. It's a disgrace to the Auto Club to drive a car on the public streets that way."

"And," added the owner with a grin, "he's always like that. I've known him to wash a customer's car for nothing, just to have it looking trim and shiny. He wants the cars he represents to look and run the best in town. And most of them do!"

Shipments of Automobiles to Brazil Shows 35 Per Cent Increase.

According to the Department of Commerce, Brazil imported \$8,000,000 worth of automobiles and motor parts from the United States during the year ending June 30, 1919.

This is an increase of 35 per cent over the value of the 1913 shipments, though the total number of machines sent to Brazil was 3 per cent less than last year.

1919 Statistics Show Number of Cars to Be 6,500,000.

The latest statistics show that the number of cars registered in all the states during 1919 will probably be close to 6,500,000. Passenger cars or trucks are manufactured in 32 different states and the factories are now said to employ more than 1,000,000 men and women.

The amount of capital invested in the manufacture of complete passenger cars or trucks now exceeds \$1,500,000,000. More than 40 per cent of the cars in operation today are said to be owned and used by farmers, and it is estimated that the total passenger mileage would be approximately 45,000,000,000 if every passenger car now in the United States traveled 3,000 miles a year.

Courtesy is a business winner, but if it is only a superficial veneer it will not ring true. The man who is truly courteous is sincerely considerate of others—at home and abroad.

It is seldom indeed that a business man has reached the maximum of his trade possibilities. All too many have a small idea of what this maximum is nor how far they are falling short of it.

Giving Tourist Road Information. (Concluded from page 28)

violently on distances. As a result, anyone who has toured is familiar with the amazing manner in which a town said to be "bout twenty miles away" is still "bout twenty miles away" after ten miles have been covered in a direction directly toward it.

No approximations or estimates should be tolerated. Careful readings of dependable speedometers which are correctly calibrated, should be made and their results accurately tabulated.

Of course, such a list as this is in many ways not as serviceable as a map. It cannot be read at a glance and hence no comprehensive notion of the entire country can be had. But it is very much cheaper and more flexible.

A map for any particular small-area about a town or community would have to be made special, by some map-maker or engineer, and hence its cost would be comparatively high. In

addition, to make extensive changes might mean the making of an entire new map.

While, on the other hand, the making of a list requires no special skill and it can be changed completely for only the cost of re-typing and the time of preparing the actual material. In this way it can be kept up-to-date with all changes and corrections.

At any rate, such a list can supply reliable road information without compelling the motorist seeking it to become the unwilling audience to an argument, and for this reason it should be able to render a small but helpful service which the automotive merchant can capitalize into dollars of good will.

Law and the Automotive Industry. (Concluded from page 24.)

value of the repairs, and hence really inures to the benefit of the mortgagee or conditional vendor.

"This course of reasoning, however persuasive it may be where the mak-

ing of repairs is involved, loses its influence where implied authority to purchase gasoline for use in operating an automobile is the subject of inquiry. Its purchase neither adds to its value, nor serves to preserve it, but rather provides a means for the one in possession to reduce its value.

"It would be doing violence to reason to imply the granting of authority to purchase such supplies under the facts of this case. This being true, the judgment must be reversed, regardless of what conclusion we might reach with reference to any implied authority to contract for the other items entering into the amount of the alleged lien, since the amount and value of the gasoline so purchased is not shown by the evidence. *Bilskie v. Bilskie* (1919) 122 N. E. 436, and authorities there cited.

"For the reason stated the judgment is reversed, with instructions to sustain appellant's motion for a new trial, and for further proceedings consistent with this opinion."—124 N. E. Rep. 470.

Window Display Attracts Attention

A Unique Window Display, Conceded by Many to Be the Most Attractive Known Was Sufficiently Successful in Point of Originality and Commanding Attention of All Passers to Recommend Itself to Imitation by Others

By Felix J. Koch

Very recently, in connection with an annual automobile show, an enterprising dealer in storage batteries contrived an exhibition which, in point of commanding attention of all passers, was sufficiently successful to recommend itself to imitation by others.

As explained by the dealer, a huge cake of ice, weighing 300 pounds, was contracted for and inside of this one of their six-volt storage batteries was frozen.

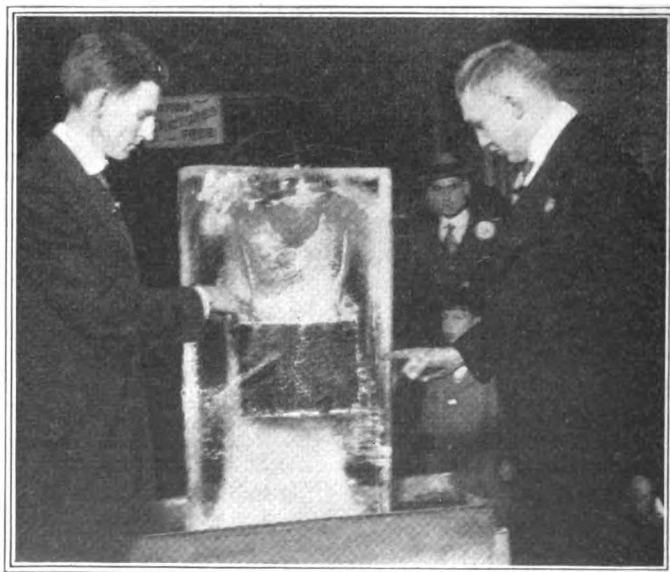
This battery was permitted to remain in its unique position for 72 hours. Then it was removed and a specific gravity reading taken. The test showed that the battery was in fully charged condition, serving to prove conclusively that it does not hurt the battery to stand in places of low temperature.

Adding to the uniqueness of the display was the flooding with light of this ice pack. To that end a six-volt, thirty-six candle-power lamp was placed beneath a black metal hood, and squarely over the ice. All light

was cut off, except that descending through the ice and the effect was very attractive.

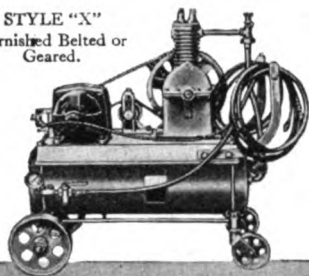
To furnish this, light wires twenty-four inches in length were run from the rear of the battery, and in such a

manner so as to stay concealed as much as possible. The exhibit was one of the most attractive known to the local trade and was considered by all who saw it as perhaps the most original ever displayed in the city.



Battery frozen in a cake of ice for 72 hours.—Unique display which attracted considerable attention.

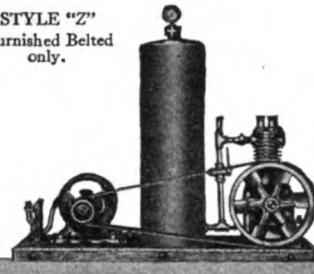
STYLE "X"
Furnished Belted or
Geared.



STYLE "S"
Simple, Popular
Belted Outfit.



STYLE "Z"
Furnished Belted
only.



The Curtis Sign is 10 x 14 inches—baked enamel on steel. It is furnished FREE with every Curtis Garage Air Compressor and cannot be obtained in any other way.



Conserve Your Patrons' Tires

Motorists will go a long ways to find the Curtis Sign and get Curtis Air—FREE FROM OIL—because it means less blowouts and greater tire mileage.

CURTIS Air

~ Free From Oil

Because of correct design and good construction, Curtis Garage Air Compressors are dependable and operate with minimum power. The patented and exclusive self-regulating splash oiling system prevents oil from getting into the air line. The air is pure, clean, safe and FREE FROM OIL.

OTHER CURTIS FEATURES

Fan flywheel cools cylinder. Valves of light weight and large area. Hand unloader permits starting against full tank pressure without injury. Large drop-forged crank shaft. Adjustable, renewable, die-cast, non-cutting bearings. Head removable without breaking pipe connections—only one gasket.

MADE IN VARIOUS SIZES

Curtis Compressors are made in various styles and sizes to suit your special needs. Write today for illustrated literature giving full particulars. Use the coupon.

CURTIS PNEUMATIC MACHINERY CO.

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Law on Purchase of "Good Will."

(Concluded from page 15)

from you and you wouldn't do it, even for a thousand to boot. Now you are trying to keep me from doing anything at all!"

Webb shrugged his shoulders.

"Can't help it, Sanderson. A contract's a contract, you know!"

Sanderson nodded, vigorously. He was beginning to see a little light.

"All right, Webb," he assented, "We'll take that contract over to Judge Williams, and leave the matter to him. Are you game?"

Webb consented, and in a few minutes they had explained the whole thing to the judge. The latter was very deliberate in rendering his opinion.

"The law is not so harsh as it used to be on the subject of good will, gentlemen," he said, slowly. "It was formerly held that a sale of the good will of the seller was similar to a guarantee on his part that he would not re-enter business again.

"The courts are not so strict nowadays. They hold, rather, that the purchase of good will is an effort to remove competition on the part of the seller, due to the peculiar advantages which he had built up for himself in the locality.

"It does not, however, prevent the seller entering in business again, provided he does not take undue advantage of his privilege. He must do nothing calculated to win back his old trade. He cannot solicit their business, or in any way simulate the methods of his old concern. With new trade, however, he has an apparently free and unrestricted hand. He cannot use the old name, but must adopt one sufficiently different so that there can be no confusion in the minds of the public. Within these limitations, gentlemen, you have the present law on 'good will.'"

Information for Receivers of Self-Propelling Vehicles.

The purchasers of self-propelling vehicles, automobile or truck, are always desirous of receiving their consignments in first class condition; this is also the aim of the manufacturers. At the point of shipment, thousands of dollars are expended annually to improve loading methods and to insure proper inspection.

A booklet containing suggestions

which will assist the dealer and receiver, and which will tend to eliminate unjust complaints has recently been issued by the National Automobile Chamber of Commerce. The following extracts should prove constructive and helpful.

UNLOADING.

Be properly equipped to unload your cars. A pair of skids (vehicle castors) are necessary to slide wheels out of car doors.

Double-decked automobiles can be easily unloaded by using chain falls or similar apparatus, thereby reducing possibility of damage.

It should be remembered that automobiles are loaded by men who are fully experienced in that line. It is apparent that dealers can only avoid damage by using suitable methods in unloading their cars.

SEAL RECORDS.

Make it a point to see the railroad cars before they are opened. Examine seals and other protective devices on all car doors (side and end). Take seal numbers—this is most important. Retain all seals for protection until you know there has been no loss or damage.

INSPECTION OF CONTENTS.

After opening car, inspect contents before unloading as to condition of blocking decking and general appearance of the shipment. This is the time to have railroad agent verify any shortage or damage by making notation of freight bill over his signature.

In case of loss or damage an affidavit should also be prepared by party inspecting and unloading car indicating condition of shipment.

DAMAGE BY FIRE OR WRECK.

In case of a carload seriously damaged by fire or wreck, communicate by wire to the factory traffic manager at point of origin and be governed by his instructions.

CAUSE OF DAMAGE.

In all cases of damage make an early report to the factory traffic manager outlining complete details and your opinion as to cause in order that suitable action may be taken.

Remember that contents and condition of every shipment are carefully checked by factory, and any loss or damage is chargeable to transportation lines, and claim should be entered with delivering carrier.

If you permit railroads to do un-

loading, it should be under your supervision.

CLAIMS.

Loss and Damage: Statement (on proper form) should be accompanied by original paid freight bill, original bill of lading, and itemized invoice. Affidavit from party unloading car. Overcharge: Find proper freight rate from factory. If charged in excess of this rate, file claim for refund of overcharge with railroad agent and attach original paid freight bill and bill of lading if not previously surrendered.

Claims should be filed immediately. The railroad is entitled to whatever is recovered from damaged parts.

Keep carbon copies of original claims and all papers sent to railroad agent or claim department. Give each claim a consecutive number. See that carrier acknowledges receipt, giving his claim number. Always show both of these numbers on subsequent correspondence.

M. & A. M. A. Sanctions Minneapolis Show for 1920.

Announcement has been made by M. L. Heminway, general manager of the Motor & Accessory Manufacturers' Association, that arrangements have been made with the Minneapolis Automobile Trade Association, whereby members of the M. & A. M. A. will participate in the show to be held in Minneapolis from January 31 to February 7, 1920.

After a careful survey of the plan and jurisdiction of the Minneapolis show, it was determined to sanction them because of the important territory covered. The automobile men of the Twin Cities are making special efforts to make the Minneapolis show one of the most important exhibitions in the history of the industry in the Middle West.

To date the Motor & Accessory Manufacturers' Association has sanctioned the automobile shows at New York, Chicago, Boston and Minneapolis.

Car of Former Russian Emperor Sold at Sale in London.

At a sale of government motor cars held in London recently, \$15,000 was paid for an automobile which was built by a famous manufacturing concern for the late emperor of Russia.

When Springs Break
put on



This is the VULCAN service sign

The Sign of Profit

This sign stands for America's highest quality replacement-spring.

This Sign brings thousands of motorists, every year, to the doors of over 7000 dealers who display it.

This sign puts large and ever-increasing profits into the cash-drawer of every one of these dealers.

Why Not Hang It Up Today?

Write for our special proposition.

Jenkins VULCAN Spring Co.

Factory

RICHMOND, INDIANA

Branches

Atlanta, Ga.

Boston, Mass.

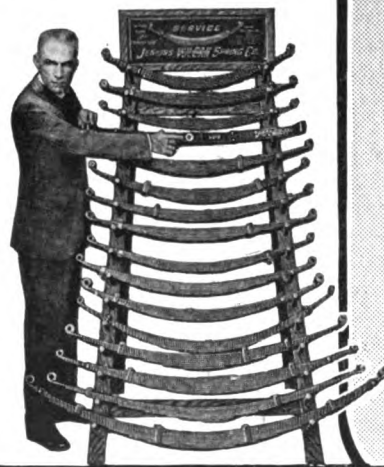
Dallas, Tex.

Kansas City, Mo.

Minneapolis, Minn.

Reading, Pa.

St. Louis, Mo.



This Spring Rack FREE with first order for 12 or more VULCAN springs.

The Cold Chisel—How to Make and Use It.

(Concluded from page 23.)

heel of the chisel down until the face of the cutting edge rests full length on the work, it will have a tendency to cut straight ahead rather than to gouge in. The position of the chisel following would possibly cut very well in very hard metal as it would have a tendency to come to the surface of the metal at each stroke of the hammer.

Ordinarily the face of the cutting edge next to the work should act as a guide while chipping or cutting the metal from the bar or block. Of course, the angle of the facets will depend to an extent on the metal to be cut. The facets forming the angle, one to the other of nearly 65 degrees is right for cast steel, while 45 to 50 degrees should be used on bronze or brass. Therefore, the more acute these angles, the nearer the body of the chisel lies parallel with the work. The hammer blows will be far more effective with the angles of the chisels properly ground.

The angle of the cutting edge should always be made as acute as the hardness of the material will permit. In case the angle is too acute, the chisel would be very apt to be bent near the cutting edge and if the reverse, the cut would crowd to the surface of the metal. Hence the object is to make them as acute as possible without causing the cutting edge to bend.

In case the metals to be cut are soft, such as copper or babbitt metal, the angles may be about 35 degrees. Regardless of the degree of angle, the cutting edge should be ground so that it will not be wedged, or it will break when driven into metal.

The chisel should be held as close to the head as possible, and so that the hand will aid in steadying the chisel. As the blow of the hammer falls on the head of the chisel, the hand holding the chisel should hold it firmly to the work, doing away with the possible vibration that will be noticed in case the chisel is held loosely in the hand. In the cutting of copper, it is a very good plan to dip the cutting edge of the chisel in water as it is possible to make a smoother cut in this manner, and with less effort.

Hardening and tempering processes are performed upon chisels for three purposes. In the first place to enable them to cut hard substances; second, to enable them to resist wear; and third, to increase the elasticity of the steel.

The first operation of hardening the steel is not of such vital importance as the drawing of the temper after the hardening. The second process will be found quite a little more difficult, inasmuch as the quality of the steel may vary in carbon content. For the ordinary cold chisel, steel with 1 per cent carbon makes a very good chisel for all-round work about the general repair-shop. Steel higher in carbon content is harder to handle because of the danger of cracking in the process of hardening and tempering.

The word "temper," as used by the manufacturer, means the percentage of carbon the steel contains. Steel of 1 per cent carbon has great toughness in the unhardened state, with a capacity of hardening at a very low heat. This steel, unlike steel with more carbon, can be welded quite successfully. This steel is much more satisfactory for chisels and hammers as it will stand a great deal of abuse without cracking or breaking, especially if properly hardened and tempered.

If the chisel is to be used on very heavy work and the hammer is of the sledge type, steel 75 points in carbon will be much more satisfactory than the 1 per cent, or 100 point carbon. This steel of 75 points in carbon will stand the greatest punishment of any steel. By making this steel into a short, heavy chisel, it can be held with tongs and a heavy sledge used for a hammer in cutting hot bars.

Hardening the Chisel.

We will suppose that the chisel has been forged to the desired shape and is ready for the hardening process. Place the chisel in the fire, heating it slowly until it is a cherry red from end to end, after which it should be immediately removed from the fire and placed in clear, cold water and kept in motion until it has the same temperature of the water in which it has been plunged. When it is taken from this bath, it will be very hard, in fact so hard that it would be absolutely useless as a chisel, or anything else for that matter. Should you strike it a blow with a hammer at this time, it would break into a number of pieces just as a piece of glass.

The next step is to put the chisel through a process that will leave one end hard enough to cut metal and the other end sufficiently soft that it can be pounded with the hammer and not chip or break. The one end must be soft or the face of the hammer would be ruined. Now we will take the chisel that we have hardened by plunging it into the water and polish it on the emery wheel for about two inches back from the cutting edge and it is ready to temper.

Tempering the Chisel.

The chisel must be tempered for the metal which it is to cut, for a chisel that would cut one metal would not be suitable for some other much harder, etc. There are a number of methods of drawing the temper in the chisel, but we will consider only one at this time, as the writer has used it very successfully for a number of years.

Take a pot that is over half the depth of the length of the chisel and melt lead in it until it is as deep as necessary, and sufficiently hot to char a pine stick when it is placed in it.

Take the chisel that has been hardened and place the hammer end down in the lead and the color will soon begin to run up toward the cutting edge of the chisel and show on the part that has been polished. The color begins with a very light straw

tint and gradually grows to a dark straw, then to a greenish tint, and then to the light and dark blue. As soon as the color comes that is wanted, plunge the chisel again into the bath of water and leave it until it has reached the same temperature as the water and it is ready to remove and grind for use.

If the chisel is to be used for cast iron, the color should be drawn to a deep straw color at the cutting edge, and a greenish tint just above this dark straw color. In case the chisel is to be used for cutting steel, the temper should be stopped when the color is a lighter straw than that used for cast iron. For wrought iron, the color should be a dark blue with the greenish tint just above it. This chisel will stand a great deal of abuse and will bend before breaking. The cutting edge will be just soft enough that a new sharp file will just cut it and that's all. In case the chisel is to be used for cutting wood, the color should be stopped at a light straw.

The cutting edge should not be finished before the tempering process is completed. Instead it should be left just a little thick and heavy at this point and finished later. It is a very good plan to have a number of chisels made up for cutting the different metals as a chisel for cutting cast iron should not be used on the steel shaft, or the one for cutting steel used on the cast iron metal, etc. After the different chisels are made up, they can be stamped, or marked in some manner, so that each one may be selected for the work with little trouble.

The cold chisel is a tool just as important as the file, the dies, etc., and should have the same consideration if good results are to be expected. Make a good chisel, and take good care of it and it will surprise you to find out the work that can be done with it.

Movement Afoot to Standardize Screw Threads.

In order to place before Congress laws that will standardize screw threads, the National Screw Thread Commission has recently been formed. The proposed legislation is of interest to tractor makers and users, as it will bar screws, nuts and bolts the threads of which are of unusual dimensions, thus simplifying one feature for automotive mechanics.

Process for Soldering Aluminum Invented by Swiss Engineer.

A recent discovery which is expected to save motor-car owners great expense has just been made by a Swiss engineer, Charles Bingelli, who has invented a process for soldering aluminum.

In a test made a short time ago two bars of aluminum were soldered. They snapped in a new place under a weight of 800 pounds pressure, but the soldered joint held successfully.



The COFFIELD TIRE PROTECTOR

makes-

**COFFIELD
PROTECTOR**

any tire wear longer

This Protector will make any tire deliver miles upon miles of greater service and longer wear than it otherwise would. Backing up the casing against stone bruises and all shocks of the road, the Protector keeps the fabric from breaking, reduces blowouts to a minimum—and in this way produces full wear from the casing.

The Coffield Protector is made of pure, live rubber and contains absolutely no fabric—as a result of which there is absolutely no friction between the protector and either the tube or the casing.

The first cost of Coffield Protectors is the only cost as they do not wear out with the tire and can be used over and over again. The Protector

will pay for itself on the first tire in which you use it—after that it pays big dividends by the extra wear it makes each succeeding tire deliver.

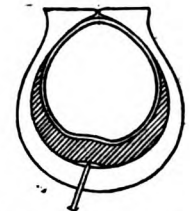
The Coffield Tire Protector never has been—and is not now—claimed as a “cure-all” for tire troubles. It is not intended for use in either damaged or worn-out tires but is for installation in new tires or tires that at least are sound—both cord and fabric.

Besides reducing blowouts almost to the vanishing point the Coffield prevents the majority of punctures. A short nail cannot reach the tube thru the thickness of the Protector and the tough rubber from which the Protector is made will turn and clinch ninety percent of the long nails the tire may pick up.

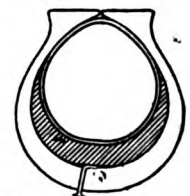
The Coffield Protector is not a new device or an experiment. For three years it has been proving its worth to car owners—thousands of the Protectors have been sold and are in use today. There are innumerable instances of the sale of just one Protector as a trial to a skeptical customer, where that customer came back to have all of his tires equipped, including the spare.

**We have a most unusually interesting
proposition for the right kind of Dealers**

The Coffield Tire Protector Co.
Dayton, Ohio



The nail goes thru the outer casing.



But the live rubber of the Coffield Protector (having no fabric) merely gives when the nail strikes it—and the nail clinches between the Protector and the casing.



Stones and other obstacles will not bruise a casing equipped with the Coffield Tire Protector—as the blow is distributed and absorbed by the entire casing rather than any one spot.

Merchants Must Know Real Profits.

(Concluded from page 17)

also a reasonable margin of profit in return for the risk they assume through the ownership of the business. The only new element arising in this illustration is that of rental. A great many merchants look upon the ownership of their business building as an opportunity to cut the cost of doing business, and therefore, to enable them to sell at a lower figure. But the ownership of the building should be considered as an independent business enterprise and should not enter into the calculations of the retail business end of it.

The merchant should look at this matter of rent in a strictly practical, common-sense way. If the merchant did not own the building he would necessarily have to pay a rental for the room which would be charged to the cost of doing business. Or if the merchant would lease the building to another he would receive in return a fair rental which would afford him an income independent of his business.

It is, therefore, logical, for the same reasons stated before, that the merchant should not consider the saving in rent effected through the ownership of the building as a part of the profits he earns as a merchant. The money that he may save by owning the building is not saved because he is a merchant but rather it is money earned by being a real estate owner.

Thus we find that a man is entitled to an income through the rental of property he may own, through the interest earnings of capital he has accumulated, through his labors, and through profits which may arise from a business enterprise due to his management and shrewdness.

Before there can be any profit the business man must first pay for the goods purchased, wages to his employees, an adequate salary to himself, rental to his landlord whether it be an outsider or himself, a fair interest on the capital invested, and all other expenses incurred in the operating of the business.

If, at the end of the year, his inventory sheet shows that his stock of goods has not shrunk in value, and his

outstanding bills are no greater, then the surplus left is profit. But if the merchant has failed to deduct any of these items of expense then the surplus is not all profit and the merchant is fooling himself.

But, you ask, how will this affect profits if I don't take out an adequate salary for myself and a fair rate of interest on my investment? To the average merchant this seems like taking money out of one pocket and putting it in another. But, while this is true, it pays to do precisely that, if you want to know whether or not you are making money as a merchant. For when a merchant has done this, he can be satisfied that any profits which the books may show, all other items being correct, are REALLY profits, and do not merely pay for something which you could do and get paid for, possibly at a better rate, without the bother and worry of having a business of your own.

The trouble lies in the fact that if the merchant who has not charged his business with these various items of expense is led to believe that his cost of doing business is low, he may decide that he can sell at a lower figure than his competitor or he may think his expense so low that he gives but little thought or attention to it and the consequences are they soon sap the life out of his business. Business after business is being operated on this same theory, sapping not the public pocketbook but its own cash drawer, and cutting its net profits because the proprietor has a narrow conception of what profits really are.

South Americans Buy Automobiles by Cubic Displacement.

Automobile buyers in Guatemala are not so much concerned about engine performance, body finish and miles per gallon when they buy a car as they are about the overall dimensions, says an automobile importer in Central America. When they look at a machine on the salesroom floor, the first question they want answered is: "How many cubic feet of air does it displace?"

"Among the complete details it is important to know those of the dimensions of the cars," he adds. "These must be particularly as follows: The

total length from end to end, the total width from side to side, and the height of the car.

"The importance of this question is due to the fact that private persons there do not use garages, but put their cars into the halls of their houses. Therefore, it is necessary to know the sizes of the cars in order to find out whether they can easily enter into these halls.

"If the cars are too wide for the halls it would be necessary to rent a garage, which would increase the cost and reduce the economy."

Aeronautical Exposition of 1920 to Be Held in Chicago.

The national aeronautical exposition in 1920 will be held in the Chicago Coliseum. The opening date will be January 8, 1920.

This exposition will precede the annual national automobile show. The patron of the event will be the Manufacturers' Aircraft Association.

Automobile. Costing \$600 Is to Be Built by Canadian Firm.

The firm of Lyall & Sons, Montreal, plans to enter the automobile manufacturing field and to produce a car costing \$600 to the purchaser. It will be equipped with a motor which is said to be unique so far as the fewness of component parts and the economy of gasoline are concerned.

The motor, according to the director of the company, has been subjected to severe tests and with improvements effected from time to time is now in a finished stage. Tests also show that it is possible to drive a car of such proportions as the one planned for a distance of 60 miles with a consumption of one gallon of gasoline.

"Optional Ignition" to Be Strong Point at New York Show.

According to information received, it is said that the significance of "optional ignition" will be played upon at the New York Motor Show in January. It is also said that many dealers are demanding that it be provided for on the advance orders which have already been placed with the manufacturers.



Take Your Choice of These Big Paying Jobs

THOUSANDS of men like you are wanted to fill these big-paying jobs in the automobile engineering field. Thousands of places are open, too, for chauffeurs and garage managers. It's easy to get one of these good jobs and to prepare yourself to hold it. You don't have to go to school. You don't have to serve an apprenticeship. Spare time only is needed. These great automobile books will teach you everything you need to know. Fifteen of the greatest engineers and experts in the business wrote them in simple language that anybody can understand.

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City..... State.....

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Facts and Ideas for the Tire Dealer

Tire Important Factor of Quiet Running of Automobile.

One phase of suitability of the automobile tire for the work which it is called upon to do is that it eliminates the noise as a car speeds along its journey. The primary function of the tire is, of course, to smooth out the many rough spots in the road's surface.

The elimination of noise made possible by the use of rubber is a very important contribution to the success of the automobile. Think of the clatter that thousands of cars going up a street at 20 miles per hour would make!

In 1845, Robert W. Thompson, of England, applied for the first patent on a pneumatic tire. His patent related to the application of elastic bearings around the tires of wheels of carriages, diminishing the noise they made while in motion.

Firestone Tire & Rubber Co. of Canada Announced.

Announcement was recently made by H. S. Firestone, president of the Firestone Tire & Rubber Co., of the formation of the Firestone Tire & Rubber Co. of Canada, Ltd. According to the announcement, a factory which will be erected at Hamilton, Ont., will begin operations in five months, with a daily capacity of 3,500 tires of all types. Approximately 2,000 persons will be employed.

The established manufacturing and business policies of the parent company will prevail in the new organization, the announcement said, but it will operate as a Canadian business, employing Canadian men and women.

While the Canadian company will operate primarily for the purpose of meeting the Canadian demand for Firestone products, it will also share in Firestone's export business, especially in that part originating in the British Empire.

Construction of Old Thread Fabric and Cord Tires Described.

"While many persons know in a general way what a cord tire is," says the sales manager of the Mohawk Rubber Co., "it would trouble the average man to tell exactly the difference between a cord tire and a regular fabric tire.

"The cord tire of today," he continued, "is a direct descendant of the old thread fabric tire—known to drivers of electric cars 10 or 12 years ago. The principle on which the old thread fabric tire and cord tire are constructed is described as follows:

"The carcass or inner fabric framework

of the tire is made of layers of parallel cotton cords which are not woven or interlaced with one another. The common fabric is constructed of regular cotton fabric where the threads running one way are woven or interlaced with the threads which run at a right angle to them.

"Rubber is squeezed into the fabric in both types, covering the cords with a rubber coating.

"When the tire is in action, it is constantly being flexed or squeezed out of shape. This is what the tire is for. For by being distorted, it absorbs the shocks of the road instead of communicating them up to the car and the passengers. This flexing or squeezing motion naturally causes a motion in the cords composing the fabric. The larger the tire, the greater the distortion and the greater the movement of the cords.

"In the fabric tire, where the cords are interlaced, the strains are greater than in the cord tire. The cords of the fabric tire are quite liable to begin to saw back and forth across each other, wearing themselves out and causing friction and heat to develop. In the cord type of tire, each cord is separated and does not touch any other cord. Consequently, these are no unnecessary strains and no sawing action.

"While it is generally admitted by tire experts that the cord tire is a distinct advantage in the larger sizes, this does not necessarily mean that it will entirely replace the fabric tire. The fabric tire still has its advantages. It is a cheaper tire to make and to buy, and it is generally conceded that in the smaller size where the flexing action is not so pronounced, it will give approximately as good service as the cord tire."

Michelin Plans Celebration of 25th Anniversary of Pneumatic Tires.

Preparations are already being made by the Michelin Tire Co. for the 25th anniversary of the introduction of the world's first pneumatic automobile tire.

Back in 1895 the Michelin Tire Co. was making detachable pneumatic bicycle tires. In that year, Edward Michelin, the head of the organization, built the first pneumatic tire which, in his judgment, was sturdy enough to bear the weight of an automobile. Automobiles were at that time just beginning to make their appearance, and such cars as were in existence were running on iron tires, or perhaps a few on solid rubber tires.

When the leaders of the automotive industry were approached by Mr. Michelin,

who suggested that they equip their cars with his tire, he was laughed to scorn by the manufacturers, who could not see how any vehicle as heavy as an automobile could be supported on air.

First Pneumatic Tires Called "Aerials" by Inventor.

It has been discovered in delving into the early history of automobile tires that pneumatic tires came very near having another name.

The inventor of the pneumatic tires, R. W. Thompson, an Englishman, called them "aerial" tires, probably because they were filled with air. In 1845 Thompson got his patents, but the invention fell into oblivion until the late eighties, when Dr. Dunlop, of Scotland, brought out his first "pneumatics."

Benzol Used for Cleaning Previous to Vulcanizing.

With the present grades of commercial gasoline there is always danger that the large amount of oil contained in it will result in poor adhesion when making tire repairs.

Benzol can be used as a satisfactory substitute for gasoline. Some of the large tire manufacturers recommend that it be used entirely in place of gasoline because of the possibility of greater uniformity of good results.

Gasoline is used to remove the last traces of oil and grease from the parts to be repaired. But if the gasoline contains a large amount of oil, great care must be taken to see that every trace of gasoline evaporates before any attempt is made to complete the repair.

A good way to test gasoline for oiliness is to put a half-teaspoonful on a sheet of white paper. If all of it evaporates in a reasonable time, leaving no oily residue, it is safe to use. But if, after it evaporates, an oil ring remains, the gasoline is hardly suitable for use.

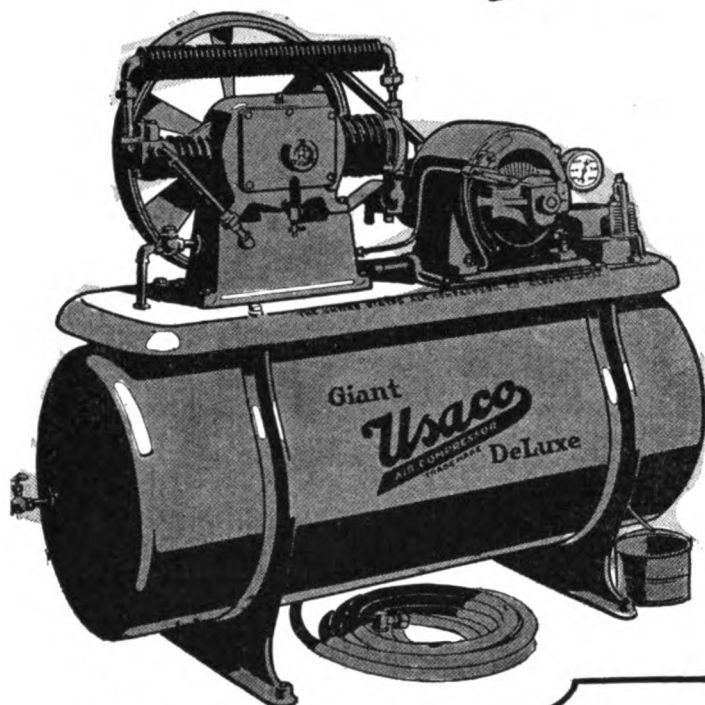
New Price List Recently Issued by Sprague Rubber Co.

A new price list has recently been issued by the Sprague Tire & Rubber Co. The Sprague tires are said to be double extra-ply; they have one ply more than many tires, and two plies more than most tires.

The price list may be obtained by writing the Sprague Tire & Rubber Co., Omaha, Neb., mentioning the American Garage & Auto Dealer.

Two Stage *Usaco* Air Compressors

(Capacity 7 cu. ft. per Minute)



THE Giant Usaco De Luxe (Capacity 7 cu. ft. per Minute), a highly refined and wholly automatic high pressure air plant. Capable of handling the severest general service ever encountered or the quick and efficient inflation of Giant truck tires.

With great tank volume and unusual compressing capacity this unit performs its duty with "gusto," yet quietly and without the slightest degree of labor or overheating.

Fundamentally, it utilizes the **Usaco** Two-Stage principle, proven without a par by virtue of the successful operation of thousands of plants throughout the world.

Automatic to the last degree, incorporating a multitude of refinements and patented features, and constructed of the best materials obtainable, this is an air plant **par excellence**.

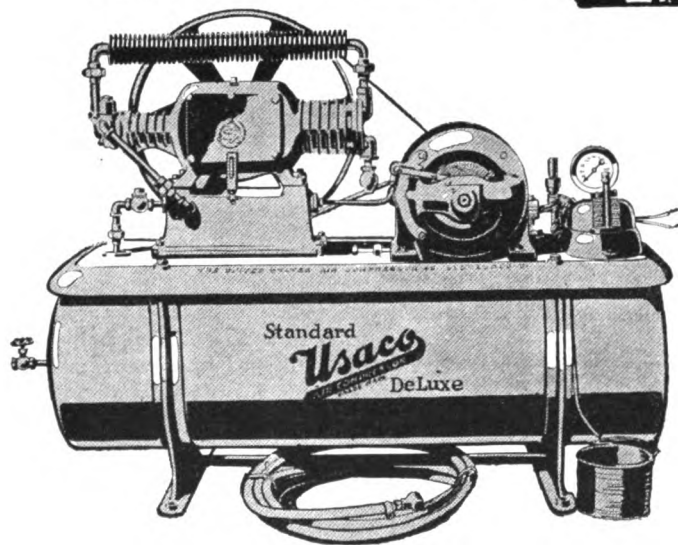
Purchasers of Usaco equipment obtain an extra measure of service because the **Patented** Unloader eliminates the possibility of overloading the motor. This device is uncommonly efficient as it eliminates the trouble at its source, being integral with the motor.

When the desired tank pressure is attained the motor is automatically



stopped and air exhausted from the auxiliary tank.

In pumping again, the motor starts without load and gradually picks up the load as the pressure raises. It is positive and foolproof as the release stays in the "open" position until the motor attains normal speed, thus preventing overloading, the cause of burned out motors, blowing of fuses and similar trouble.



The **Standard** Usaco De Luxe (Capacity 4 cu. ft. per Minute), is an air plant that needs no introduction. It is found in the majority of the best establishments and is recognized by authorities as a "unit without an equal."

The Standard is a high pressure general utility plant that puts the finishing touch to the best equipped garages, tire shops and filling stations.

This machine incorporates the same refinements and operating advantages as the Usaco Giant, differing only in capacity. Like the Giant, it is shipped completely assembled and ready to operate when attached to electricity supply.

The automatic features, safety factors and great ability in proportion to rated capacity, make both units foolproof and capable of operating for years to come with freedom from repairs.

**The United States
Air Compressor Co.**
6542 Carnegie Ave. *Cleveland, Ohio*

From the Truck and Trailer Field

Accounts on Truck Operation Important in Judging Values.

Keeping accurate accounts of the cost of operating motor trucks is important if the best results are to be obtained. The items which affect the expense of operation fall into two classes—fixed and variable.

The first classification includes the charge to retire the investment, interest on the investment, insurance, garage, licenses, driver and similar items. It is usually fixed by determining by experiment a time in which the investment shall be charged off—three, five or more years, and charging each year the corresponding fraction of the cost.

Some concerns vary this by charging off a fraction of the previous value. For instance, if the truck cost \$3,000, and one-half was decided on, the first year the liquidation charge would be \$1,500; the second year, \$750; the third year, \$375; the fourth year, \$187.50. At the end of five years, the investment in the truck is only \$88.75.

Interest each year should be charged on the first cost, less the amount charged off for liquidating the principal. In the case of a \$3,000 truck being liquidated in equal amounts in five years, the interest the first year would be charged on \$3,000; the second year, on \$2,400; the third year, on \$1,800; the fourth year, on \$1,200; the fifth year, on \$600. If the truck is used after the fifth year, no charge on investment or interest would be made, as the truck has retired its cost.

The second class of charges is the troublesome one. Oil, gasoline, and tires are easy, and are dependent largely on mileage.

The item of repairs, parts and lost time are the big variables with different trucks and different handling. The frequency of trips to the repair shop—the time the truck stays there—the charge for the repair—these furnish an index to the quality of the truck and the service received.

The most serious source of expense is lost time, which means not only the cost of repair, but interruption of business and expense for another truck.

Owners should keep accurate accounts. It will translate mechanical advantages into terms of dollars and cents saved.

Five-Ton Oneida Motor Truck Does Kangaroo Stunt.

"Necessity may be the mother of invention, but we can learn a lot in a pinch from

Mother Nature," says W. C. Calvert, head of the Oneida Motor Truck Co.'s haulage analysis department.

This remark was made after an amusing incident had occurred at the factory of the company in Green Bay, Wis.

Space had been reserved at the Electric Show in Chicago and at the last minute, for some reason, those who were loading the material for the exhibition missed getting the new Oneida electric truck on the

The Motor Truck as an Aid to the Railroad Administration.

Director General Hines of the United States Railroad Administration, in a statement made public recently, predicts a serious shortage of freight car transportation facilities. The statement is addressed to shippers and receivers and urges them to help relieve the impending congestion.

Commenting on the announcement, R. E. Fulton, vice-president of the International Motor Co., said: "Director Hines' appeal prompts the question, 'In what way can the motor truck best serve to assist the railroad administration?' To answer this is but to emphasize the necessity of co-operation with the railways rather than competition. Let the motor truck take over completely the traffic it has already proved itself to be more efficient to handle. Let them be, in effect, branch lines and feeders of the railroads to unload the freight at the outlying railroad yards and deliver it to the consignee's door, incidentally at a lower cost and more quickly. This would release valuable car space that is ordinarily tied up in switching cars around within a city, and eliminate the necessity of leaving cars on sidings or spur tracks until they can be picked up by a locomotive.

"The development of motor express routes to handle tonnage over shorter distances should be encouraged because they relieve freight cars for long-distance transportation. Shippers as well as the motor express companies should do all in their power to provide capacity loads."

This appeal by the railroad administration has a vast significance to the motor truck industry. It is proof that the railroads do need the co-operation of all the participants in the nation's transportation scheme, and that the motor truck will be called upon more and more each day to take over the traffic that the railroads cannot accommodate.

To the dealer it offers unlimited encouragement and should be an incentive to intensify selling efforts. To the general public it will mean better transportation service at a lower cost. The goods shipped by motor truck will reach the consignee quicker and in better condition.

As far as cost is concerned, the motor truck has already shown that it is more economical than the railways in this form of transportation. Yet a great many people have still to be educated to these facts.

The Fourteen-Year Mules.

An interesting statement has just been made by Secretary Gibson, of the Horse Publicity Association of America, a newly-created organization to disseminate propaganda aimed against the motor truck.

The statement referred to is as follows: "Two mules that cost less than \$500 have been driven on the streets of Richmond, Va., for 14 years. In that time they have traveled 43,400 miles, nearly twice around the world, and they have hauled 52,080 tons, equal to 3,472 cars, or a freight train 26 miles in length. I should like to see a truck equal that."

"Inasmuch as our company has only been in existence 10 years," says the advertising manager of a truck manufacturer, "we cannot point to trucks that have been driven for 14 years, but we want to call Mr. Gibson's attention to a 1½-ton truck that is now in its seventh year.

This truck was used in Marion, Ind., for over six years and a few months ago was traded in for a larger truck. The old truck is now being operated daily by a Pittsburg transfer company.

During the six years that the truck was driven in Marion, Ind., it covered 240,000 miles, and in that time established the almost incredible record of over 361,000 ton-miles. In terms of 'around-the-world,' this truck has covered the distance almost 10 times, and if we had to wait for a freight train long enough to accommodate this tonnage to pass, we should have to wait a long time.

And we should remember that it took Mr. Gibson's mules 14 years to haul the 52,000 tons, while the one truck, in six years, hauled over 361,000 tons."

express train that was to carry it there.

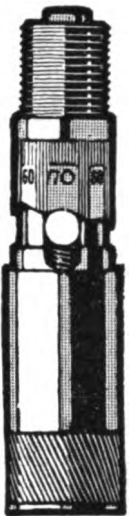
The outlook was rather discouraging to say the least. Finally someone had a bright idea and suggested that if a kangaroo could carry her young in a pouch, a big Oneida could carry a little one to the Chicago Electrical Show. So a two-ton electric was loaded onto a five-ton gasoline truck and through mud and water, down into ditches and up again, the big Oneida ploughed like a caterpillar tractor.

It is needless to add that Chicago was reached in record time.

The Whistler

TRADE MARK
"IT WHISTLES WHEN IT'S HAD ENOUGH"

would have saved that blowout!



Here it is,
screw it on
Twice
actual size

ONE blowout may cost you a big piece of business—may endanger a life—certainly it is most unpleasant.

Why risk it? Nearly all blowouts are caused by overinflation. With Whistlers on your tires you can't overinflate if you set them for the right amount of air. They automatically close when the pressure is just right, saving your tires and helping your car.

The Whistler Pressure Regulator is an automatic tire valve that screws right on over the ordinary valve. It protects and guards your tires from the large losses occasioned by incorrect inflation.

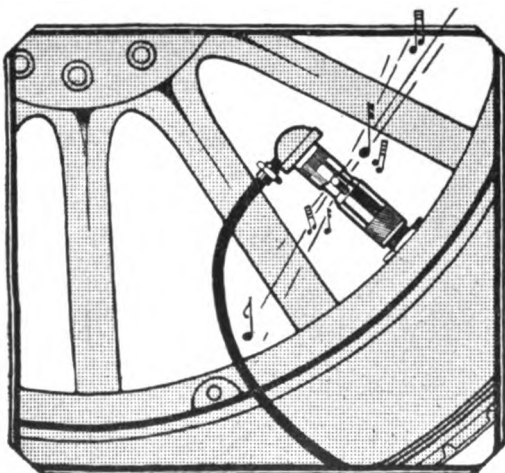
This extraordinary invention has enjoyed a great introduction, both to the consumer and to the trade. At the close of its first year, we feel confident in saying that it has *made good* as one of the steady, consistent sellers. Turnovers are quick and sure—profits generous and selling helps are of the right kind.

If you haven't stocked the Whistler yet, be sure and do so without delay. Ask your jobber or write us.

We shall exhibit at the New York Show, Grand Central Palace, January 3rd to 10th, 1920.

The Automatic Safety Tire Valve Corporation

1765 Broadway, New York City



Farm Automotive Equipment News

Tests Show Advantages of Increased Plowing Speeds.

By C. H. Sprague,

*Sales Engineering Department, The
Cleveland Tractor Co.*

The old saying that "it is hard to get out of the rut" seems to still hold true today in regard to plowing. There is much diversity of opinion as to the proper speed for plowing, but the chief argument for slow plowing seems to be that "grandfather did it."

Regardless of what you attempt, it is a slow and difficult proposition to swing people from habits they have cultivated for years. That is just what is occurring now in regard to plowing; slowly the progressive farmers are coming out strongly in favor of faster plowing. This is emphasized by the great demand for the fast, light tractor.

First, let us consider what a good job of plowing is. One of the chief objects of plowing is to pulverize the soil. The plow may invert the furrow slice in a perfect manner, and completely bury all vegetation or trash, but if it fails to pulverize, and leaves the soil in such a condition that the harrow cannot complete the work in the best and cheapest manner, it is not satisfactory. A good job of plowing occurs when the soil is thrown over in a well-pulverized and leveled condition, so that it can be planted with the minimum amount of labor and preparation.

What occurs when you plow slowly; that is, with a speed of 2 to 2½ miles per hour? The soil is turned over slowly and does not tend to pulverize to any extent, but to maintain the same shape as when cut from the land. Hence, the furrow slices are laid against each other and the plowed field takes on a ridged appearance. Think of the great amount of soil surface that is exposed to the drying action of the elements.

This plowing does not reduce to a minimum the preparation of the soil before seeding. It is no different than the plowing done by horses; the ridged condition makes it necessary to bring the field back to its leveled state. Also trash and weeds

can be seen poking their heads up between the furrow slices, ready to grow again. The jointer fails to bury the weeds in the corner of the furrow where they belong. Large clods are noticeable which, if not broken up soon after plowing, become dry and hard. Air pockets are numerous where the furrow slices are laid upon each other and due to the large clods, are difficult to eliminate.

Plowing at a speed of 3 to 3½ miles per hour is referred to as fast plowing. The soil is shoved up rapidly and tends to go up high on the turn of the mould board and is then thrown over well-pulverized and in a level condition.

With the soil in this shape it can be

get crops in quickly. Here is where fast plowing saves time for the farmer and fulfills his expectation of reducing the labor on crops.

Farm-Electric Plants Boon to House Life on Farm.

Since the innovation of the automobile and the individual farm-electric plant, the farmer's wife is coming into her own and her home is undergoing a change gradually but surely.

For many years the country woman was without the many advantages and conveniences which have come through science and development. While scientists and

inventors were developing the reaper, the tractor, the truck, the gasoline engine, and other machinery to aid the farmer in his work of production, nothing was done to lift the burdens of the farmer's wife.

For the most part she swept by hand, churned by hand, washed by hand, and sewed by uncertain light. No invention of the era has done quite so much to better her condition as the modern electric lighting and power

plants, and, of course, the automobile.

She now has a vacuum sweeper with which to do her cleaning, her churn is operated by an electric motor, an electric washer has supplanted the old machine, and there are many other improvements which can be traced to the new plants which furnish the necessary power for pumping.

Iowa Shows Remarkable Increase in Use of Tractors.

We have heard a great deal about motorizing farm labor, but it is doubtful if the people in the East really know how widely the tractor and other automotive machinery has been adopted for agricultural purposes. Some facts just made public by Ivanhoe Whitted, of the Iowa Department of Agriculture, are of particular interest:

Iowa has the distinction of having an automobile for every seven persons in the state, and as the farm ownership of pas-



Fig. 1—Results of Fast Plowing.



Fig. 2—Results of Slow Plowing.

made ready for planting with very little preparation. The field is level and has a granulated covering of soil over it to prevent escape of moisture, so that in case the soil is not worked for some time after plowing, the harm done would be greatly minimized.

The trash is well covered, very seldom will one see weeds or vegetation showing where the soil has been turned rapidly, and is level. Where the trash is buried in one corner of the furrow much better connection is made with the subsoil by the remainder of the furrow slice.

Scouring is often greatly facilitated by increasing the speed. As every farmer knows, there are often soft spots in a field which have a tendency to clog up the plows, and to start the plow scouring, it is necessary to speed up a team after getting out of one of these soft spots. The furrow wall will also appear more clean-cut and neater than the slower job.

Farmers agree that one of the greatest arguments for the tractor is its ability to

*Try this
test with
Oro*

Filtered Air

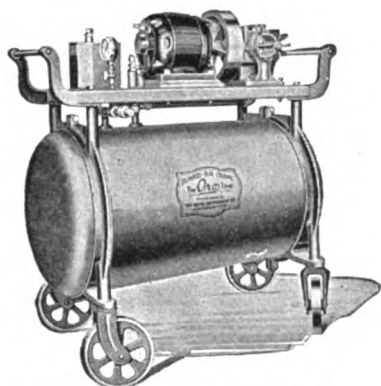


TAKE a sheet of clean white paper and hold it before the nozzle of a No. 7 Filtered Air Outfit. Turn on the air and watch the paper. You won't see a particle of oil, dust or dirt collect on the paper! The reason is very simple. The air has been washed thoroughly and is free of oil, dust, dirt and all foreign matter that might possibly injure a tire.

And because motorists appreciate the value of using such air in their tires, the Filtered Air Outfit is a wonderfully profitable investment for you. You attract trade—you hold it. You make it worth while for all classes of motorists to come to your place of business and they will gladly buy from you the things you can supply for their cars.

THE AU-TO COMPRESSOR CO.

304 S. Mulberry Street WILMINGTON, OHIO

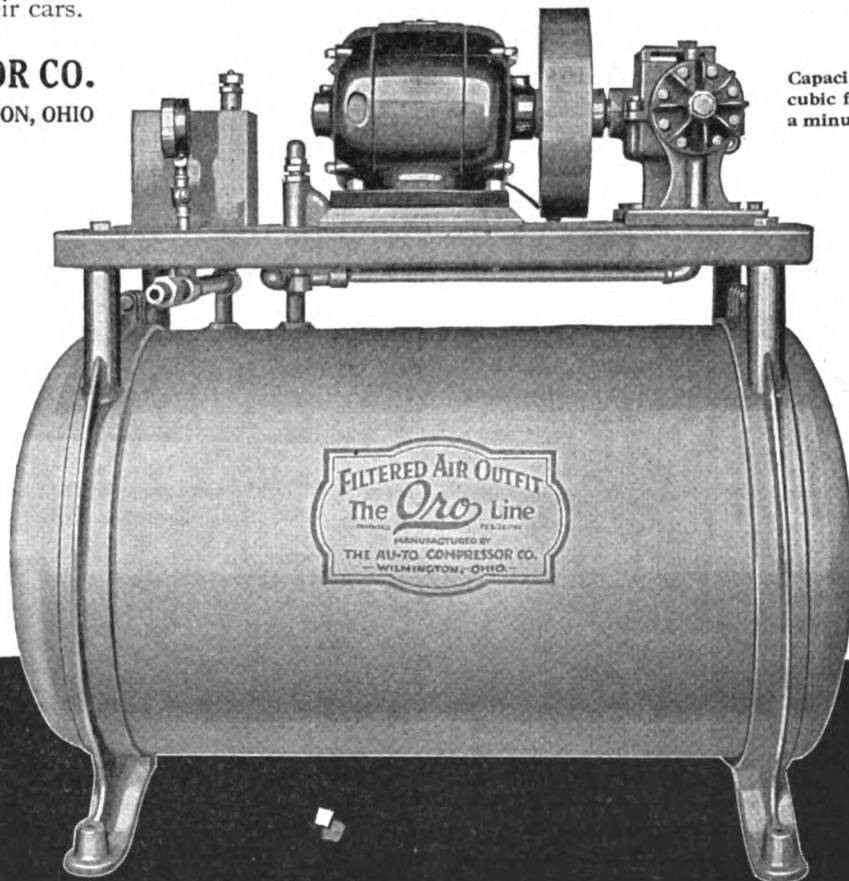


Model No. 8 Au-To Air Compressor—same as No. 7, excepting that it has large wheel casters, which make it easy to move from place to place in the shop or garage.

A Remarkable Outfit

The "Filtered Air" outfit is complete—ready to run. You simply connect it with your electric wiring and it will immediately fill the tank with perfectly clean air, and keep the tank full—day and night. Sufficient pressure for pneumatic truck tires up to 150 lbs. Only 3 moving parts to compressor mechanism, in addition to valves. $\frac{1}{2}$ horse power motor.

Get this splendid machine and watch your business increase! Ask your jobber, or send us his name and we will see that you are supplied quickly.



Capacity over 4 cubic feet of air a minute.

a sign like this



brings business.

senger cars has been large for several years, it is not surprising that farmers have been quick to see the value of the motor truck for farm labor.

"Six years ago," says Mr. Whitted, "there were not more than 1,000 farm tractors in the state. On January 1 of the present year there were, by actual count, 9,100 tractors on the farms ready for spring work.

"With due respect and consideration to the theories of the back-to-the-land enthusiasts, I believe that the new order is vastly to be preferred to the old, and that so far at least the cityward trend of population has in no way proved detrimental to agriculture.

"Under the old regime, nobody got ahead. Everybody, farmer and town dweller alike, was out at the knees and down at the heel, in striking contrast to present day conditions. It is the great cities, with their teeming millions of busy workers, that constitute the farmer's most important market, and his prosperity has been coincident with the growth of civic centers.

"When the war broke out, Iowa had no farm labor to spare. In 1915 the situation was aggravated by the demand for workers in munition plants and factories engaged on war contracts. Iowa furnished 100,000 men for the army and navy, and no man knows how many more thousands left the farms, stores, trades, and professions to take up war work of some kind."

La Crosse Tractor Co. Makes Price Cut of 30 Per Cent.

Following a recent meeting of distributors of the La Crosse Tractor Co., at which 65 distributing agencies of the United States and Canada were represented, announcement was made that the price of the La Crosse tractor would be cut 30 per cent. It was stated that the plant would concentrate upon quantity production to make up by volume the reduction of profit caused by the drastic slash in price.

There was an immediate stampede to place allotment contracts for the ensuing year, and within a half-hour, it is said, orders for \$3,000,000 had been placed for delivery as soon as possible.

Many of the requests for allotments were more than cut in half in order that the probable production of the factory could be apportioned among all of the dealers who were demanding machines.

Presidential Train of Mexico Equipped with Lighting Plant.

The presidential train of the Republic of Mexico, renowned as perhaps the most elaborate train in the world, presented by the Pullman company to the Mexican gov-

ernment, has just been equipped throughout with electric lights and a Matthews full-automatic plant has been installed.

This train was presented during the regime of Diaz and has been in constant service since that time. It is most lavishly decorated and finished without regard to expense, several of the interiors being trimmed in gold leaf, with intricate and classic hand carvings, and inlaid with ivory. With its present equipment, this train now possesses every possible modern convenience.

The Tractor Serves Many Purposes in Orchard Cultivation.

Most orchard owners who have found tractors valuable in their work do not have the difficulty that they anticipated in keeping the machine busy in their 10 or 20-acre groves. They now find that many tasks outside of cultivation are easily and quickly accomplished by the use of the tractor.

The World Moves.

Nowadays we see the tractor doing duty like a charm; it's the most important factor in the business of the farm. Oh, we see the farmer sitting on a spring seat painted green, and a wondrous gait he's hitting, as he tools his weird machine. Horses look to him like fakers, and for mules, he'd give no mon, for he plows a dozen acres where a team would fail at one. As I view the mighty tractor olden times return to me, when I was a tragic actor in the scenes of husbandry. One old mule was my allotment, one old mule of brindled gray, and she knew just what a swat meant, for I larruped her all day. All the weary day I whacked her, soaked her ribs and then again, and I longed to have a tractor, which was not invented then. With a club her ribs I polished, hoping thus some speed to gain; but all schedules were abolished by that mule and clods were vain. All my better years were squandered in this slow and futile way; up and down the field I wandered, slow as goose grease, through the day. And the mule—at last I sacked her and took up a fountain pen, sore because the useful tractor had not been invented then.—Walt Mason.

Where orchard cultivation must be kept up until August or September, this work alone keeps the tractor busy during the greater part of the time. It is then found that the machine is handy in pulling out dead and unprofitable trees and sawing them up into firewood, a job which must be done frequently in well-kept orchards. Stumps must be dragged away when trees are sawed up.

When the spraying outfit comes on the land, it is usually drawn through the rows by the tractor, and the work is quickly done. One spraying contractor states that he can spray 20 acres per day with his tractor-drawn outfit.

Course in Agricultural Power Farming in University of Nebraska.

The growth and importance of the truck and tractor on the farms is indicated in the addition the University of Nebraska has made to its course in agricultural power farming at the state agricultural college.

Four-week courses are given in intensive training in the mechanism, handling, and care of trucks, tractors, automobiles and the farm shop, or home carpentering and blacksmithing. Fifty students are entered at the present time. Most of them desire training in the operation and repair of tractors, but several have taken the course in trucks and in the farm shop.

A farmer may enter any Monday morning. He is required to devote eight hours a week to the course. Two hours of lectures are given daily and six hours of actual practice or operation.

The course is especially intended for farmers and is given only during the winter months when work on the farms is slack. The "any Monday morning" feature was introduced a short time ago, and is for the purpose of allowing entrance any time a farmer may have four weeks' time to spare. Only one course can be taken at a time.

Uses Tractor for Clearing, Cultivating, and Seeding.

Eighty acres of land cleared, cultivated and seeded in one year, including the largest acreage planted to certified potato seed in the state of Virginia, all without a horse setting foot on his place—that is the unusual record made by T. V. Taber, a young farmer near Charlottesville, Va.

This farmer drives an automobile when he wants to go to town, and says he will continue to farm without a horse on his place. Clearing land, leveling it, dragging, disking, harrowing, cutting silage, running the cream separator—no matter what he does on the farm that needs power, he uses his gasoline tractor.

The same summer that he developed his farm, Taber purchased one-fortieth of all the certified potato seed in local markets. As a result, he has 55 acres planted to such seed this year. He thinks two records—farming 80 acres without a horse and having the largest field of certified potatoes the first year in a new state—isn't so bad.

Tractor Engine Cylinders.

When the tractor engine cylinders become scored, it is better to grind than to rebore them. If you haven't the facilities in your repair shop to do this, send them to the factory or a machine shop that makes a specialty of regrinding.

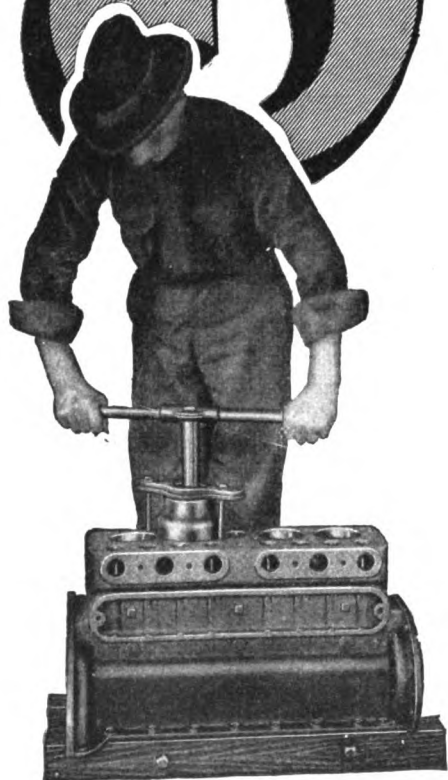


DON'T
let winter
weather
close your
shop
or cut
your profits

Keep the shop busy and make big money with

STORM

REBORING MACHINES



Reboring Fordson Cylinders with
STORM Standard Reboring Machine

RIGHT now is the time for every garage man to cash in big on motor rebuilding.

Put a STORM Reboring Machine in your shop now. Do the cylinder reboring, the most important and the most profitable part of the work, yourself, and make these extra profits.

STORM Reboring Machines are standardized. Made in various capacities to meet your individual requirements. Built for hand or power operation.

STORM Motor Repair Equipment

Cylinder Reboring Machines
Valve Port Renewing Tools
Connecting Rod Gauges
Bearing Tools

Piston Vises
Main Bearing Babbiting
and Boring Tools

STORM Tools offer you the best investment you could make to bring *more jobs* into your shop. They will keep your shop busy all the time.

Write us today for full information.

STORM MFG. CO.

Dept. E,

Minneapolis, Minnesota

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Accessories — They Bring in Money

Corrugated Lock Washers Designed to Insure Adjustment.

There are any number of adjustments on an automotive engine that absolutely must "stay put." In vibration, it is not uncommon for nuts to become loose and even for bolts to fall out. The slightest disturbance very often works havoc.

Not many automotive manufacturers and



The Corrugated Lock Washer.

dealers are aware of the value of corrugated lock washers, but it is only a question of time when these valuable devices will become as standard as nuts and bolts. The corrugated lock washer, manufactured by the Smith & Hemenway Co., has six bearing surfaces. The corrugated ridges go entirely around the washer and insure an absolutely tight point.

By using the corrugated lock washers, the owner does not have any cause to worry

about the condition of the nuts and bolts in out of the way places on his car. It is good engineering practice to follow, that wherever there is a bolt or nut subject to the least vibration, a corrugated lock washer should be used to set it for all time.

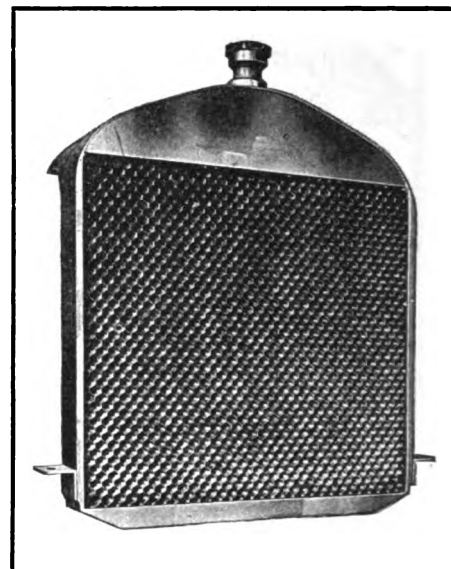
Dealers should write to the Smith & Hemenway Co., Inc., 261 Broadway, New York City, for trade prices and circulars, mentioning the American Garage & Auto Dealer.

New Windshield Cleaner Which Will Appeal to Motorists.

A new type of windshield cleaner is being made by The Presto-Felt Mfg. Co., and is called "The Presto-Felt Windshield Cleaner." It is made with two chemically-treated felt pads which are pressed against either side of the windshield by means of oil-tempered, spring steel holders. These spring holders insure uniform tension, prevent rattling, and keep the cleaner from dropping down in the line of vision of the person driving the car.

As the windshield becomes thoroughly wet in a rain, the cleaner, with its chemically-treated pads, is swung back and forth across the glass three or four times until the action of the water causes the chemical to flow. Then, as the felt pads wipe the water off the glass, they also deposit a thin film of the chemical on the glass.

As a result of this the water does not stick to the glass and form in "beads." Instead, as soon as the rain strikes the windshield, the drops of water are said to flatten out, leaving a clean, "flat," transparent sur-



Lawson Efficient Cooling Radiator.

face through which the driver can distinctly see the road and clearly distinguish objects ahead of the car.

The makers say that the cleaner is so designed that it fits any and all types of windshields. All necessary parts are furnished with each cleaner for attaching.

The several distinctive features possessed by the Presto-Felt cleaner will undoubtedly appeal to all drivers because of the universal difficulties encountered when driving during a rain.

Write to The Presto-Felt Mfg. Co., Toledo, Ohio, for more detailed information and trade prices, mentioning the American Garage & Auto Dealer.

Radiator for Which Makers Claim Superior Service Marketed.

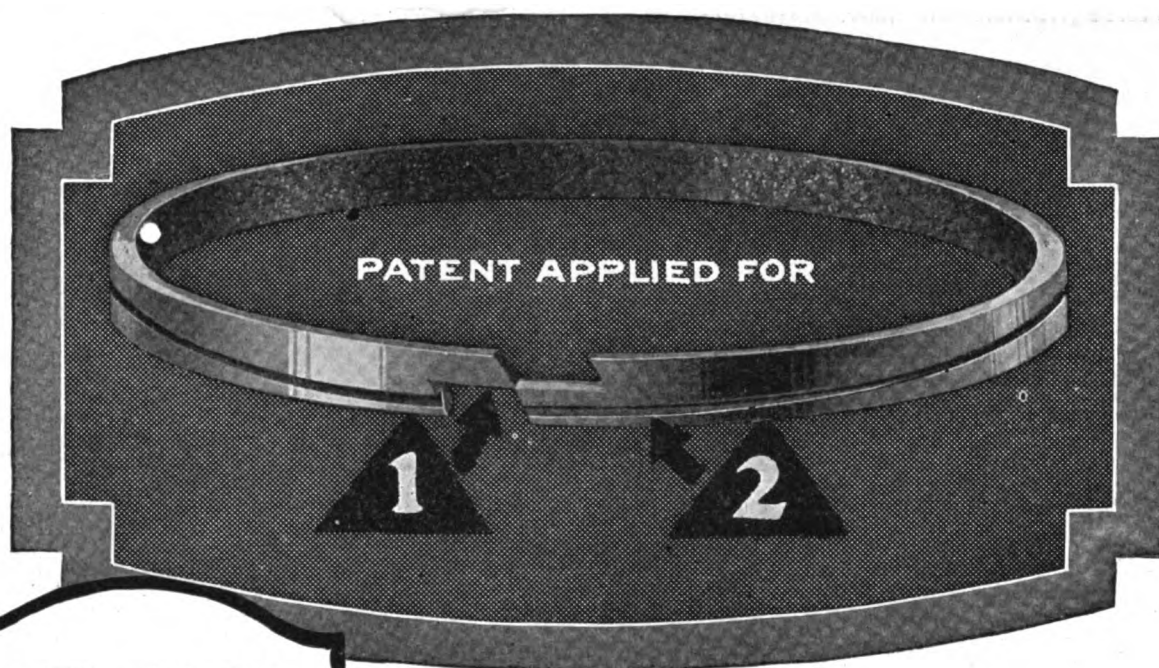
A column of air for every column of water is the claim of the F. H. Lawson Co. for its product, the White radiator.

This radiator, the manufacturers further claim, has ample air space to allow for a current sufficient to cool this volume of water; it has double the amount of water in contact with the air currents; double the amount of radiating surface; a core made of the finest ductile, soft brass, with all joints floated in high-grade solder, and is flexible and at the same time rugged.

The makers add that this radiator is built on the basic fact that the function of a radiator is not to heat a given volume



"The Presto-Felt Windshield Cleaner" in Place, Showing Spring Steel Holders.



- 1 The Lightning Cut
- 2 Oil Distributing Groove

RIGHT: Shows shape of oil groove. Note scraping edge.

BOTTOM: Shows upward course of oil groove.



Lightning Cut Locks Itself Against Compression Leaks

WHEN expansion forces the horizontal cut, the edges of the diagonal cut maintain a sliding contact on the opposite wall. It locks against compression leaks. That's why the Lightning Cut combines the old diagonal and step cuts.

The natural friction between piston ring and cylinder wall is minimized. The Lightning Cut oil groove, extending in an upward sweep around the ring carries oil to where it does the most good. The straight edge of this notched groove effectively scrapes away all excess oil. It goes back to the crank case for further duty.

Lightning Cut Rings are individually cast. All sides cool immediately. Their fine texture, evenness of tensile strength, and "springy" tension are not duplicated in rings sliced from pot castings. The scale left on the inside gives extra "springiness." There is no wear on cylinder walls due to unequal ring pressure for Lightning Cut Rings are of full concentric design. And since no material is cut away there are no spaces for oil to accumulate and carbonize.

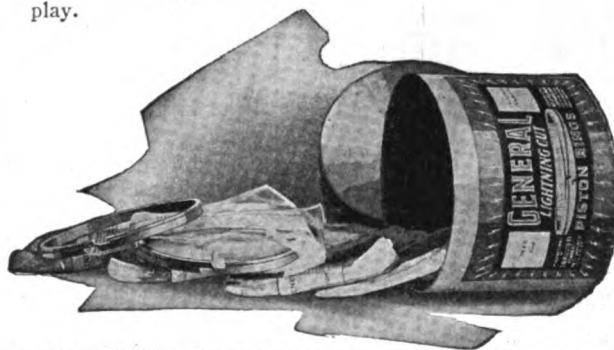
Lightning Cut Rings, because of one piece construc-

tion, offer only a single unit for the flow of heat during expansion. Their strength prevents breakage. Their simplicity makes for easy installation. You're safe when you sell Lightning Cut Rings. Safe when you promise your trade more power and more mileage, with less fuel, less oil, less friction, less wear and fewer repairs.

GENERAL LIGHTNING CUT PISTON RINGS

Jobbers

You're safe, too, on profits. We are revolutionizing the marketing of piston rings. Our selling plan is of vital interest to you. If you don't send in an initial order today at least write or wire for details. Made in all sizes. Packed in oil proof envelopes. Neatly boxed, one dozen to the carton. Cartons are attractively labelled and make a handsome display.



UTILITIES SALES CORPORATION

Sales Representatives

GENERAL UTILITY COMPANY

Factory 1324 Ogden St. Philadelphia - Office 809 New Stock Exchange Bldg. Philadelphia

Utilities that Sell Because They Serve

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

of air, but to cool a given volume of water. The air is said to pass through so freely because of the wide-mouth horizontal air spaces that a cool volume is always in contact with the heated walls of the water cells. Because of the vertical air spaces between the tubes, there is said to be sufficient expansion to help prevent bursting when the water freezes.

Trade prices and detailed information may be obtained by writing to the F. H. Lawson Co., Cincinnati, Ohio, mentioning the American Garage & Auto Dealer.

Marathon Products Embody Special Features.

Cord tires, fabric tires, and running-board mats are the three products which the Marathon Tire & Rubber Co. offers to the trade.

A special feature of the cord tire, the maker says, is that the tough, wear-resisting stock which is used in the tread is extended over the sidewalls to the bead. This is to prevent chafing and scuffing off of the sidewalls when the tire is driven over rough, rutty, or frozen roads.

The fabric tire is said to possess the same commendable features as the cord tire. The stock on the sidewall, however, is white and the tread is black.

The Marathon mats were designed for use on the running boards in front of the doors to prevent mud, dirt and grease from being tracked into the car and ruin-



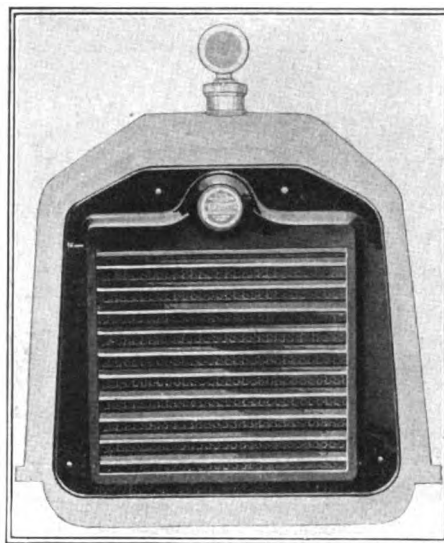
The Marathon Tires.

ing the floor carpet. They are also said to prevent unsightly holes being worn in the running board. A small rest for the heel to prevent slipping is used as an accelerator mat, and to conceal holes made in the floor covering by the heel.

Further information and dealers' prices can be obtained by writing to the Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, mentioning the American Garage & Auto Dealer.

Automatic Shutter Device for Automobile Radiator Marketed.

While employed as a motor expert many years ago, Christian Nielsen, of Chicago, conceived the basic idea of "Winterfront",



Automatic Shutter Device for Radiators.

the new shutter device for automobile radiators now marketed by the Pines Mfg. Co.

Nielsen experienced the difficulties encountered by all motorists in cold weather ever since the first gasoline car was sold to the public. In cold weather he found starting difficult and after starting, that there was a lack of power.

He found that a car, although in perfect mechanical condition, would stall if taken on the road before it was thoroughly warmed up.

The adjustment of the carburetor to a very rich mixture was not enough to secure power and when making a long run this adjustment would often prove too rich, again producing a result unsatisfactory to the motorist and harmful to the motor.

It was found that these conditions were somewhat but not entirely relieved by the use of leather radiator covers. In the end, a series of shutters connected with a thermostat arranged to be easily attached to the front of the radiator, was devised and in due time patented.

In every way, it is declared, "Winterfront" is an automatic regulator of the engine temperature through controlling the radiator temperature and the flow of air through it. Circulars and trade prices will be furnished to those writing to the Pines Mfg. Co., 56 East Randolph St., Chicago, Ill., mentioning the American Garage & Auto Dealer.

A Combination of Four Attachments for the Ford.

A combination of four of the most important attachments for the Ford: a radius rod brace, an anti-rattler, an axle support and steering device in one, is manufactured by the Casco Co.

Other products for which the company makes the highest recommendations are: An automatic drain cock; a one-minute attachment fan-belt guide; a coil box protector against rain and snow.

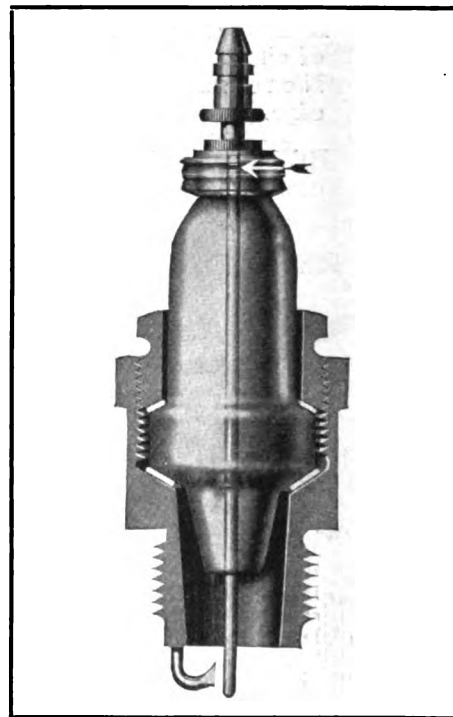
Further information and trade prices can be obtained by writing the Casco Mfg. Co., Thomasville, Ga., mentioning the American Garage & Auto Dealer.

Sparkplug With Intensified Flame New Product of Penn Mfg. Co.

The same principle applied in increasing the intensity of waves in wireless telegraphy is used in the construction of the Penn Vacuum-Fire sparkplug, a new product of the Penn Mfg. Co.

By producing a jump-gap spark in a vacuum chamber built into the head of the plug, the intensity of the flame delivered at the firing point is heightened from two to twelve times. This intensified flame, the manufacturers claim, will fire through grease or oil. It is also said to burn carbon deposits from the points of the plug, thereby eliminating missing or skipping, and producing nearly perfect combustion of each charge of gasoline.

An added feature of the vacuum-fire



The Vacuum-Fire Sparkplug.

plug is its wide points, which deliver a ribbon-like flame that greatly increases the efficiency of the plug. The external appearance of this sparkplug is distinctive in design and will undoubtedly be most attractive to all automobile owners.

Dealers can obtain catalogs and trade prices by writing to the Penn Mfg. Co., 319 West Ninth St., Kansas City, Mo. Don't fail to mention the American Garage & Auto Dealer when you write.

WHICH SPRING Do You Recommend?



THE car owner who asks you that, the customer whose confidence you have won through square-dealing, will buy the spring you recommend.

He takes you at your word. He depends on your judgment. He places his safety in your hands.

That's why it pays to handle only Harvey Springs. Each of the 1,000 kinds of Harvey Springs is specially built to solve a particular problem and each is a master work of engineering skill. Every Harvey Spring is subjected to unusual tests and when it is put out to the trade under Harvey guarantee it can be depended upon. The Harvey standard backs up the dealer's recommendation with unflinching service.

Write for the Harvey Book containing specifications of springs for all cars.

Harvey dealers are well equipped with sales helps, movie slides, window decalcomanias and inside wall posters as well as the helpful Harvey Book.

The Harvey Spring & Forging Co.
104 C 17th Street RACINE, WIS.

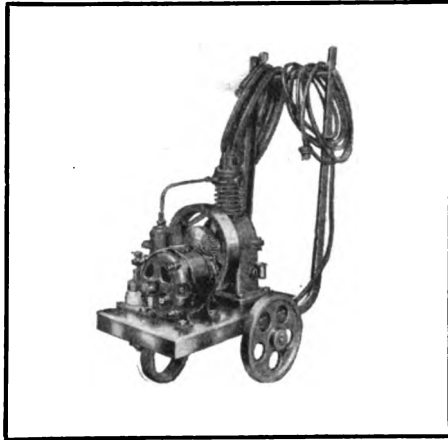
Easy Riding
Guaranteed

Harvey
RACINE
SPRINGS

Garage Equipment for Better Efficiency

Serviceable Portable Compressor Designed for Small Needs.

To meet an insistent demand for a small portable outfit for direct pumping of air, free from oil, the Curtis Pneumatic Machinery Co. perfected and has just placed on the market its style Y, $\frac{1}{4}$ h. p. outfit, especially designed for private garages or small public garages and filling stations. This



Curtiss Portable Air Compressor.

outfit, the maker states, should not be confused with little makeshift "pumps." It is reliable, designed for real service, and made in every way up to the usual Curtis standard.

With a controlled splash oiling system, and many other exclusive features, it is furnished either portable or stationary—and comes geared only. This outfit is not intended for continuous duty or pumping into a tank, as it is a special purpose machine and it is guaranteed by the manufacturers as convenient and inexpensive and at the same time thoroughly dependable.

Prices and detailed description can be

Inquiry Coupon.

Readers of this paper are invited to ask us for information concerning anything described in its pages or about any motor vehicle parts or accessories. This information will be furnished whether or not the requests come from subscribers.

American Garage & Auto Dealer,
116 S. Michigan Avenue,
Chicago, Ill.

Please supply me with information as to trade discount and nearest source of obtaining the articles given below:

.....

.....

.....

.....

Name.....

Address.....

obtained from the Curtis Pneumatic Machinery Co., St. Louis, Mo. Don't fail to mention the American Garage & Auto Dealer when you are writing.

New Device for Storing Parts in Service Station Marketed.

It is said that more valuable time goes to waste through improper stockroom facilities than from any other operation in the modern service station. A new device for saving time and labor in the Ford Service station is the Steere Servistock parts system.

The Steere idea is to have all the parts stored in units numerically arranged following the Ford parts list—each number having a bin by itself. The bins, in turn, are built in proportion to the size of the part and quantity of parts required for a month's business.

With this system, the makers claim, cheap labor may be employed in the stockroom, because a stock clerk need not know the difference between a stud and a bolt. If he can read numbers, he can fill a stock order.

The units are also arranged to minimize the walking distance in filling an order. For instance, in the filling of a parts order on a rear axle job, which is one of the most common jobs, these parts come in adjacent units which carry the complete rear axle assembly, and are located near the shop service window.

Units carrying all parts necessary for the less common jobs are placed correspondingly farther away. The number of units to be installed is determined by the volume of stock required. Standard systems are 11 units, 28 units, and 42 units.

The Fairbanks Co., New York, N. Y., is merchandising the Steere Servistock parts system. Further particulars and prices can be obtained from them. Mention the American Garage & Auto Dealer when you write.

An Out-in-the-Open-Test for Cylinder Variations.

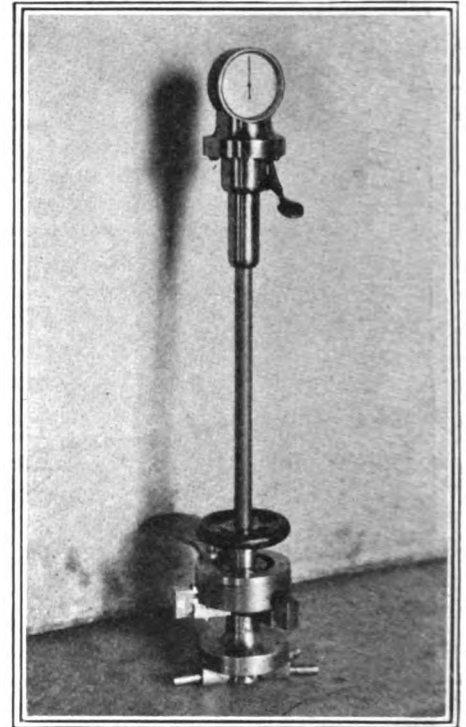
By means of the movement of a dial hand to either side of zero, inaccuracies in cylinders are tested with a new gage manufactured by the Federal Products Corp.

The gage feelers are inserted in the cylinder. These bear at their inner ends, by means of spiral springs, against a cone cam which is directly connected by a steel rod, running through an outer casing to a rack and spur movement operating the gage dial. A lever is also attached to the steel rod by means of which the cone cam is lowered, permitting the feelers to recede

sufficiently to be inserted in the cylinder.

The gage body turns freely and slides in and out through the centralizing support permitting the feelers to bear wherever desired on the inner cylinder walls. The dial is graduated to thousandths of an inch, and can be turned to any position so that readings can be taken in the best possible light.

The Federal gage is said to operate equally well in a vertical or horizontal position. That it assures accuracy, saves time, and is



Cylinder Testing Gage.

a valuable aid to the repairman is the guarantee of the manufacturers.

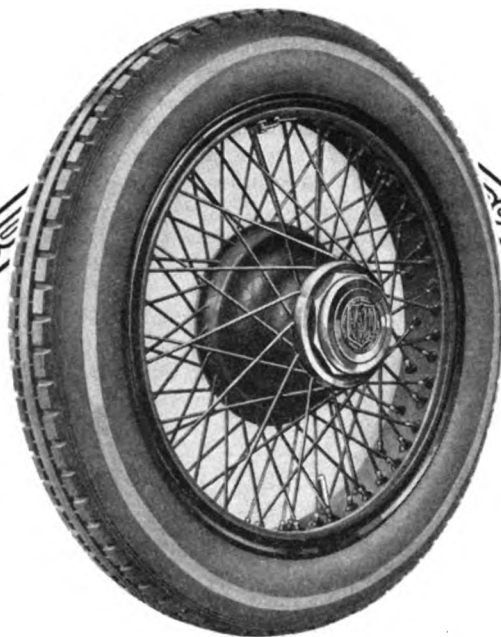
Garagemen and repairmen should send to the Federal Products Corp., 393 Harris Ave., Providence, R. I., for catalogs and prices, mentioning the American Garage & Auto Dealer.

Semi-Annual Catalog of Black & Decker Mfg. Co., Issued.

The semi-annual catalog of the Black & Decker Mfg. Co. has just been issued. This catalog describes and illustrates many essential garage equipments, such as air compressors, portable electric drills, electric valve grinders, etc.

The makers guarantee against defective workmanship and material, in backing their claim that in all products efficient service and long life have been of primary consideration.

This catalog should prove very valuable



QUALITY FIRST In PASCO WIRE WHEELS

Inborn quality—the ingenious safety-lock, the distinctive method of spoke-lacing, the indestructible hub cap, the complete curb-clearance, the maintaining of the standard wood wheel tread—this inborn quality is the standard to which PASCO WIRE WHEELS are built. And with large and efficient production—no royalties to pay to outside patent holders—we are able to offer this quality product at a minimum price.

NATIONAL WIRE WHEEL WORKS, *Inc.*

General Sales Offices: DETROIT, MICHIGAN

Factory: HAGERSTOWN, MD.

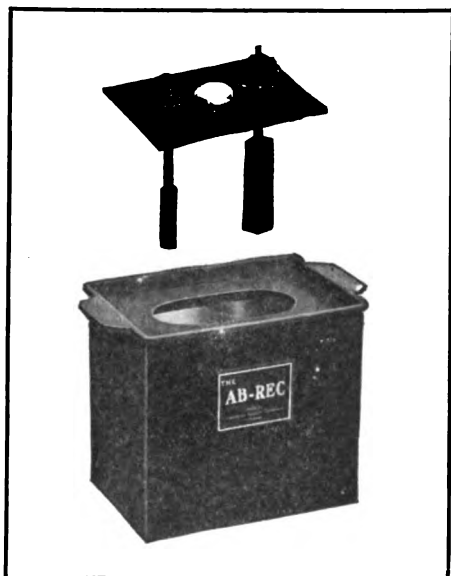
Canadian Distributors: NORTHERN ELECTRIC COMPANY, *Ltd.*, MONTREAL

to garage owners, and repairmen and we cannot urge them too strongly to write for it to the Black & Decker Mfg. Co., Townson Heights, Baltimore, Md. Mention the American Garage & Auto Dealer.

New Battery Charger as Simple as The Electric Iron.

"The Ab-rec enables you to charge a 6, 8, 12, 18, or 20-volt storage battery from an alternating current circuit," says the American Battery Co. of the new device which it is preparing for the market.

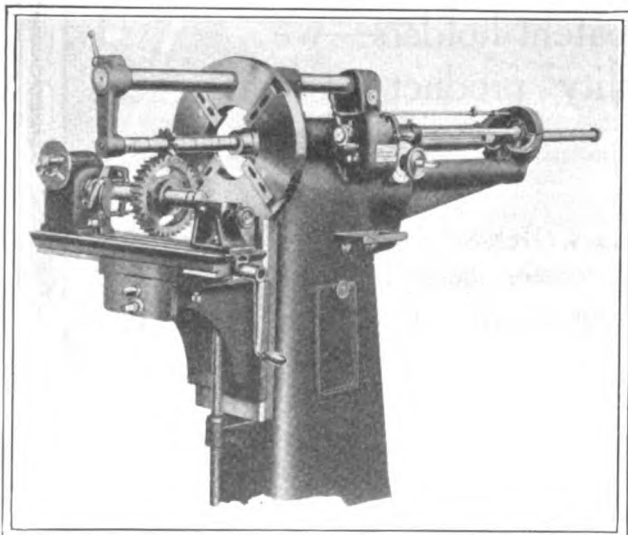
It is almost as easy to manage this elec-



The Rectifier, Showing Electrodes.

trolytic rectifier as an electric iron, it is claimed. Screw the attachment plug into any socket where there is alternating current and then run two wires from the terminals to the storage battery. Turn the storage key and the battery will receive direct current.

A current of about two amperes, charging a six-volt battery, will be passed by the device, but when a higher voltage



The Multi-purpose Machine for Automotive Repair Work.

battery is charged, it will be somewhat less.

It is completely automatic in operation, there are no regulating appliances. The manufacturers state that in ordinary use this rectifier cannot be overloaded or burned out. Of extreme importance is the fact that the Ab-rec has no moving parts. Simplicity and reliability, the two features most to be desired in any type of garage equipment are guaranteed in this new product.

Prices and descriptive literature will be sent to those writing the American Battery Co., 1132-1134 Fulton St., Chicago, Ill. Don't fail to mention the American Garage & Auto Dealer.

Machine for Drilling, Boring, Milling, and Gear Cutting.

A many-use machine recently introduced for automotive repair work and which is said to have the advantage of three expensive outfits for boring, milling, and drilling, assembled in one machine, is manufactured by the Mill City Co.

The Kriesel multi-purpose machine, the manufacturers claim, is designed in accordance with the best engineering principles, and constructed for extreme strength and simplicity. The frame and base are cast in one unit to assure perfect alignment of parts. The machine weighs 1,000 lbs. It was designed particularly to fill a long felt want in tool rooms in making dies, jigs, and fixtures. It is possible to purchase the machine for boring and re-boring work only, and later add the milling and drilling features.

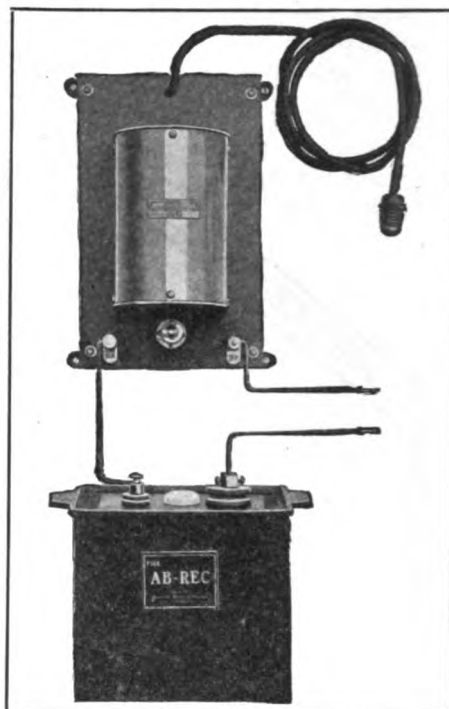
The Kriesel machine is especially designed for automotive repair work and is sold on a plan which is the combination of exclusive territory and trade-building service.

The service is said to be handled by experienced men and part of it will consist of a liberal supply of copy and cuts for display advertisements and special articles telling the owners of cars, tractors, in fact every owner of a machine of any kind for miles on every side of you have the most up-to-date equipment in your shop for remedying their repair troubles. This is an excellent machine; it takes the place of special equipment, and is just the very thing garage-men have been in need of.

Further information regarding the Kriesel multi-purpose machine can be obtained by writing to the Mill City Co., Plymouth Bldg., Minneapolis, and mentioning the American Garage & Auto Dealer.

Accurate Piston Gage for Aligning at the Bench.

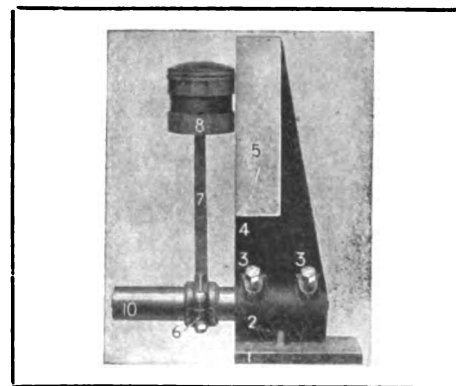
Although every good mechanic knows the importance of accurate piston aligning, he has very often had to "take a chance."



The Rectifier Outfit Ready for Use.

A poorly aligned piston causes knocking, loss of compression and oil leakage.

Now, however, there is no necessity for these serious troubles, says the Stevens company, for piston aligning can now be done 100 per cent accurately at the bench with its new piston-aligning and bearing-fitting gage. In addition to aligning the piston, the tool trues up the connecting rod



Piston Aligning Tool.

and wrist pin, and does the work in one-fifth of the time ordinarily required.

Several special features are embodied in the new gage. It has a body with a 1 1/2-inch hole for the arbors which are made crankshaft size of steel carefully machined.

The manufacturers offer to refund the money on this gage, if after 30 days the purchaser is not satisfied with the product. Send your order to Stevens & Co., 375 Broadway, New York, and mention the American Garage & Auto Dealer.

GLOBE

(two stage)

AIR COMPRESSORS

meet all requirements

Globe Air Compressors were the original two-stage compressors—we were the first to realize that something more powerful than a "one lung" was needed. In our two-stage types, we produced more pressure than had hitherto been possible. Consequently when pneumatic truck tires came into general use, GLOBE COMPRESSORS were equal to the task of inflating them.

It means a great deal to the garage or service station to be able to furnish air service to trucks using pneumatic tires. The quantities of gasoline and oil these trucks use run into money and their expenditure for parts and repairs is considerable.

This business logically goes to the place that gives them dependable air service.

Consider the ever-increasing use of pneumatic truck tires—then investigate GLOBE COMPRESSORS.

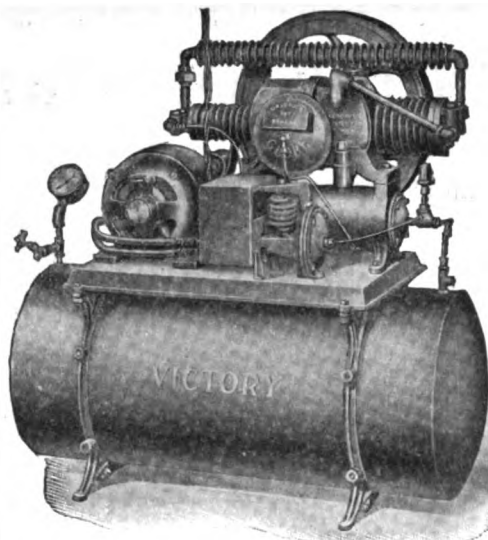
You will find that these compressors not only furnish sufficient pressure, but are economical in the use of power, and are extremely dependable and long lived.

Full particulars on request

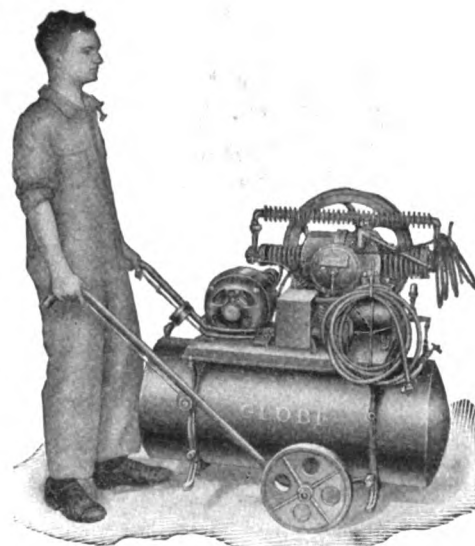
GLOBE MFG. CO.

Battle Creek

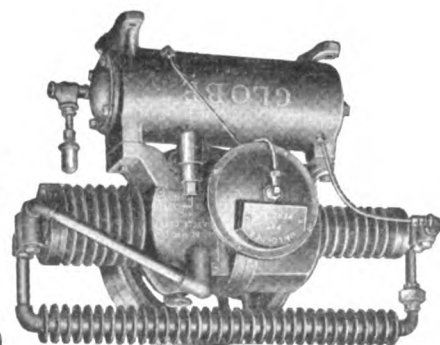
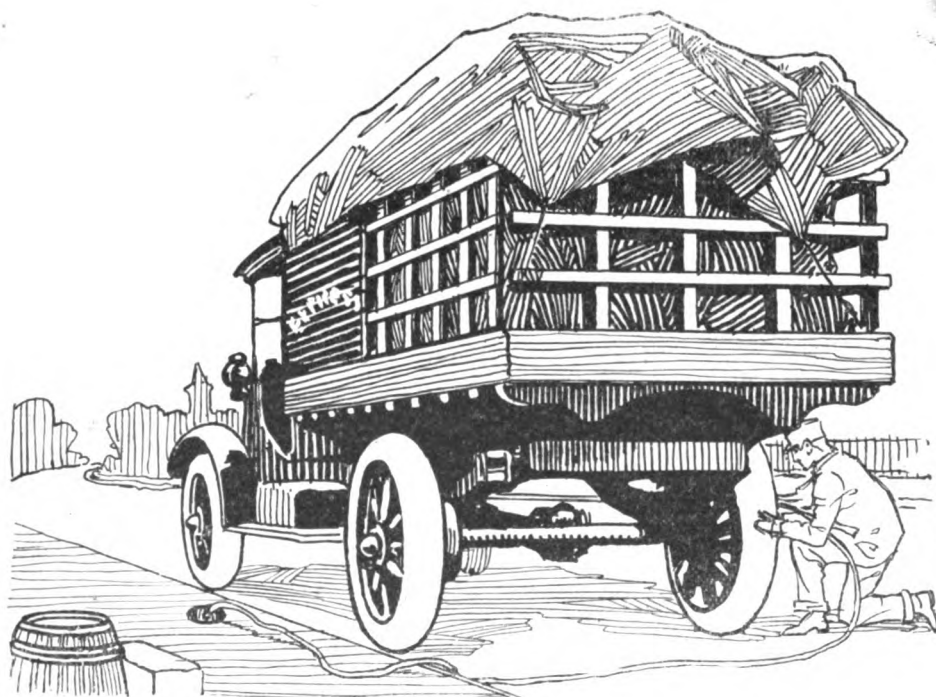
Michigan



"VICTORY" Complete Automatic Motor Drive Unit



"VICTORY-PORTABLE"



**GLOBE TYPE B
Two Stage Compressor for
Belt Drive**

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

News of Manufacturers and Jobbers

Sunnyhome Exhibits "Human" Electric Farm-Power Plant.

As the visitors entered the Sunnyhome Electric Co.'s building at the Wisconsin State Fair, they were greeted with music

production of hand grenades and other ordnance, and is located on a tract of 25 acres of LaFayette property.

The factory is now being equipped with machinery especially adapted to the advanced specifications of the LaFayette car

development of the industrial community, already well started, as a principal source of factory labor.

New Company Organized to Manufacture Special Metal Bodies.

It is announced that the Dayton Metal Body Co. has been organized at Dayton, Ohio, by Robert Dutch and H. J. Oakes, both of whom have been manufacturers of automobile bodies for more than 14 years.

An up-to-date factory has recently been erected just north of Dayton and the new firm is featuring at the moment its "Classiford" bodies. Three models are being shown: One that converts a Ford chassis into a five-passenger touring car; a roadster; and also a speedster model.

The experience and reputation of Messrs. Dutch and Oakes in the automotive industry gives assurance of the success and substantial growth of the organization.

Northwestern Chemical Co.'s Products at the Equipment Show.

An interesting exhibit at the recent show in Chicago, conducted by the Automotive Equipment Association, was that of the Northwestern Chemical Co., of Marietta, Ohio, which showed the application of Norwesco products.

A 1914 model Maxwell automobile, which from all appearances had evidently seen its best days, a car that had never been repainted, was used by Norwesco. Just one-half of the body was refinished from stem

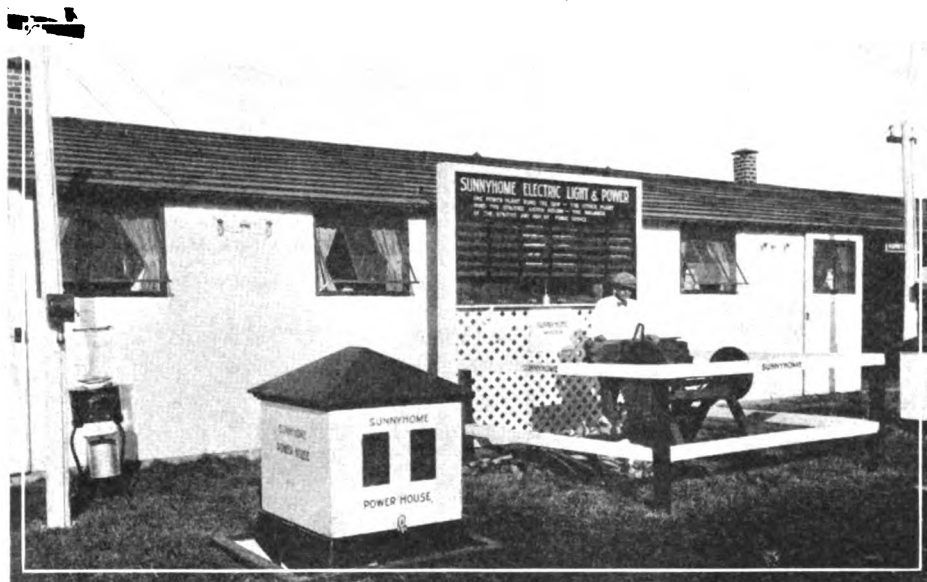


Exhibit of Sunnyhome Electric Plant at State Fair.

from an electric piano and were shown table utilities such as the coffee percolator, and toaster and casserole, then the electric iron, the churn, the vacuum cleaner, the washing machine, the electric fan, the cream separator, and a water system which included bathroom equipment.

These are only a few of the many comforts and conveniences made possible by the complete little power plant which the company manufactures. This unique outfit sits in its own little power house out in the yard. It operates automatically and requires no attention except filling with gasoline. Once in a year it is charged with lubricating oil.

In fact, the manufacturers say, Sunnyhome is almost human. It starts and stops itself and when it is out of fuel, shows a red light located somewhere in the farmer's house.

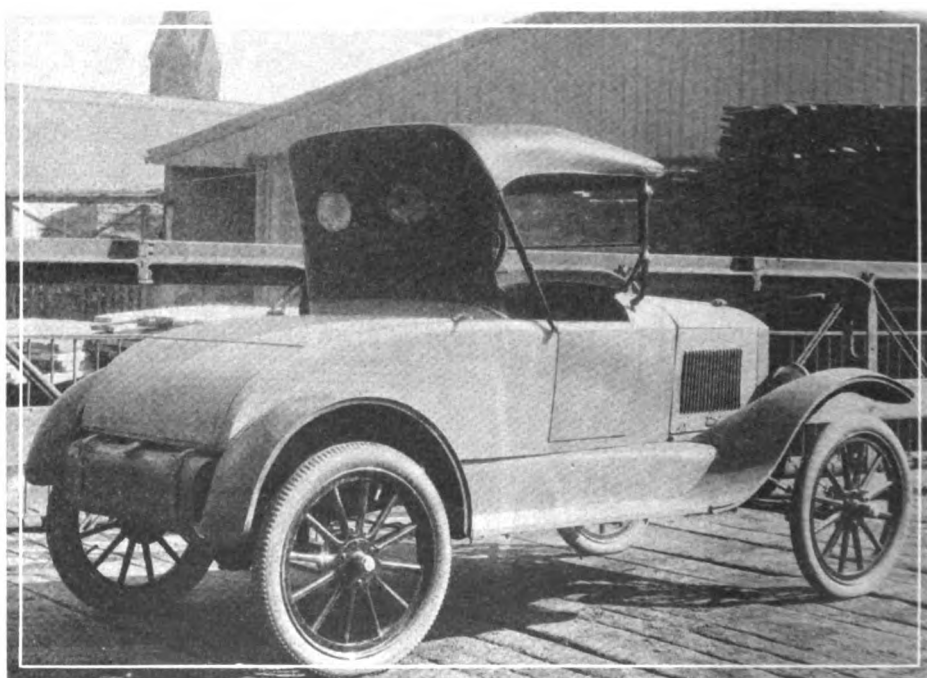
LaFayette Motors Co. Moves Into Large, Modern Plant.

With a large, modern plant as a basis of operations, one of the gravest problems usually confronting new manufacturers has been automatically removed from the LaFayette Motors Co., of Indianapolis, Ind.

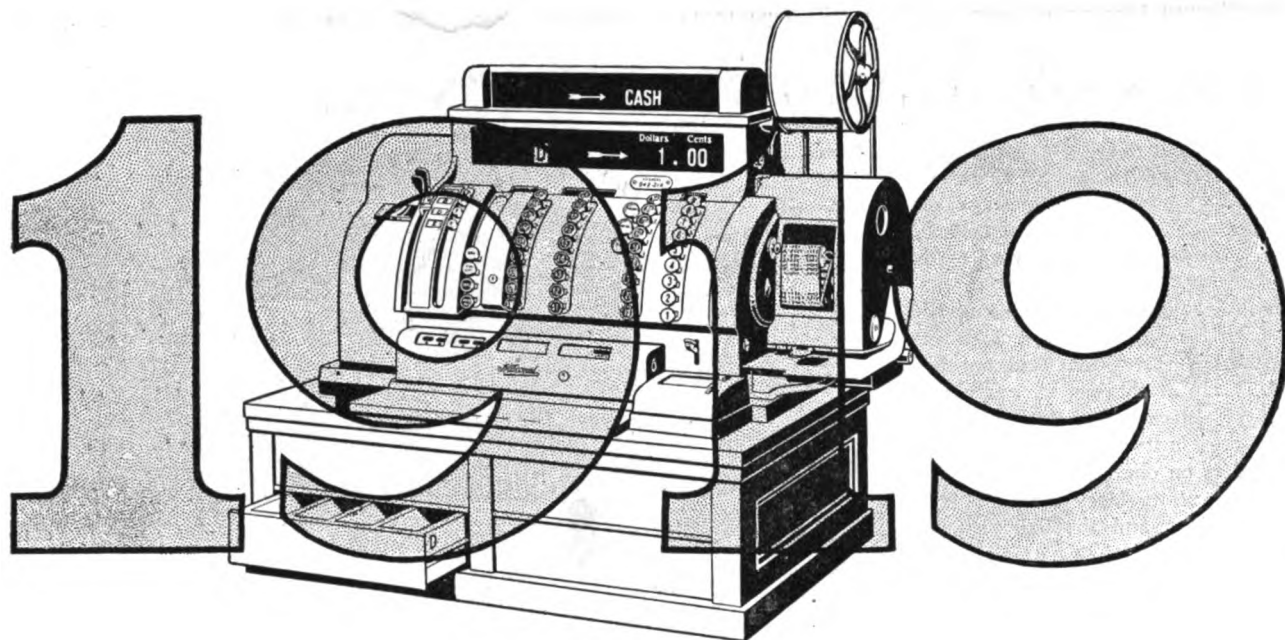
The present plant, while it is large enough to take care of immediate production requirements, is only the first unit of a model industrial layout. It was used by the government during the war for the

designed by D. McCall White. The company plans to exhibit a car during the New York show and expects to be in production early next summer.

Situated at Mars Hill, a suburb $4\frac{1}{2}$ miles from the center of Indianapolis, it is the intention of the company to encourage the



One of the "Classiford" Bodies—Makes Ford Look Classy.



Our business doubled this year

WE did twice as much business this year as we did during any other year in our history.

This shows that merchants realize more than ever before that they should get their store records quickly and economically by machinery instead of by the slow, expensive hand method.

It shows in the best way possible that up-to-date National

Cash Registers are helping merchants solve their problems most satisfactorily to themselves, their clerks, and their customers.

It is the very best evidence that our efforts to build a labor and time-saving machine are appreciated by merchants everywhere. It shows that up-to-date National Cash Registers are meeting the needs of retail stores in every country in the world.

Up-to-date National Cash Registers are a business necessity

The National Cash Register Company, Dayton, Ohio
Offices in all the principal cities of the world

Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers

to stern showed how an old car can be made new looking again by the products of the company.

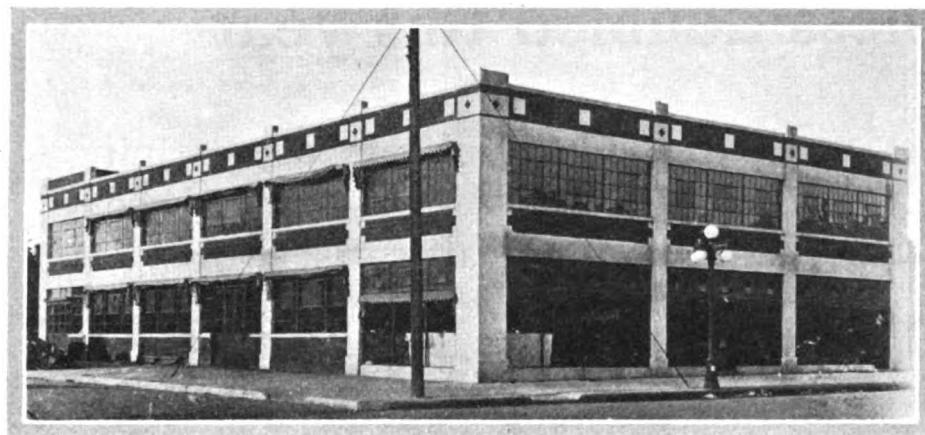
The radiator was badly mashed and several tubes were broken. These were repaired by Se-Ment-Ol. The head of the motor was off and showed two cylinders which had been cleaned by Carbonox, carbon remover. The two remaining cylinders were dirty, showing the actual work of this carbon remover.

Two valves were ground, by using Norwesco valve grinding compound in contrast with two valves that had not been touched. Half of the engine was painted with Gray & Black Never-Burn, the other half remaining in its natural condition.

The fenders on one side of the car were painted with utility black, as well as the cushions, the top and the body showing leather dressing, mohair dressing, and black color varnish, respectively.

New Factory for Manufacture of Rose Tire Pump Hose.

The J. H. Haney Co. of Hastings, Neb.,



New, Modern Factory of J. H. Haney & Co., Hastings, Neb.

has erected a new modern factory building for the manufacture of Rose tire pump hose and Rose grease guns.

The building is of modern construction, well lighted and ventilated and equipped with the latest automatic machinery.

The basement is used for stockrooms; the first floor is devoted entirely to manufacturing, while the second floor is used for assembling and packing.

The volume of business has increased so rapidly in the last two years that in order to take care of the present trade and also anticipate a substantial growth in the future the company has been obliged to increase its factory facilities.

The J. H. Haney Co., claims to be the largest manufacturer of grease guns and has always taken just pride in the character of the patrons it has served.

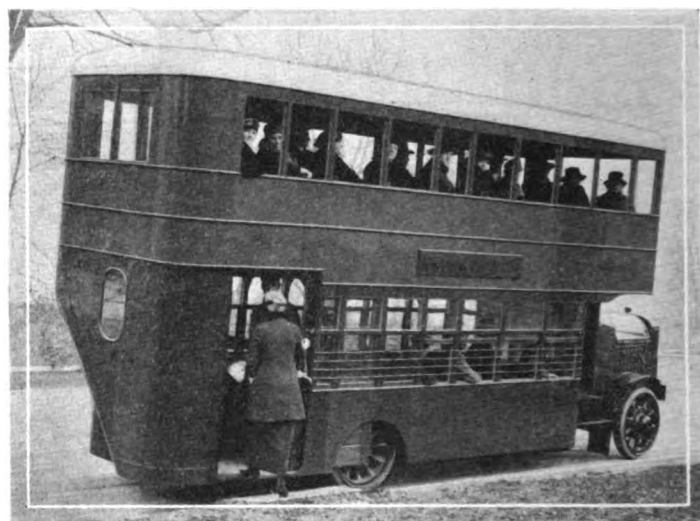
Chicago's New All-Weather Bus Increases Transportation Facilities.

A brand new and striking type of motor vehicle—a motor bus with covered upper deck practically enclosed in glass, the first

of its type to be operated in America—has recently been brought out by the Chicago Motor Bus Co.

Like the older type bus, it has the front-wheel drive, the floor on a level with the curbing for convenience and speed in taking on and off passengers and the covered straight stairway which is safer than the winding and exposed one. The difference lies in the covered top with glass windows in the sides and in the seating capacity. Where the older type could accommodate but 51 passengers, the new bus seats 60.

The principal element in the construc-



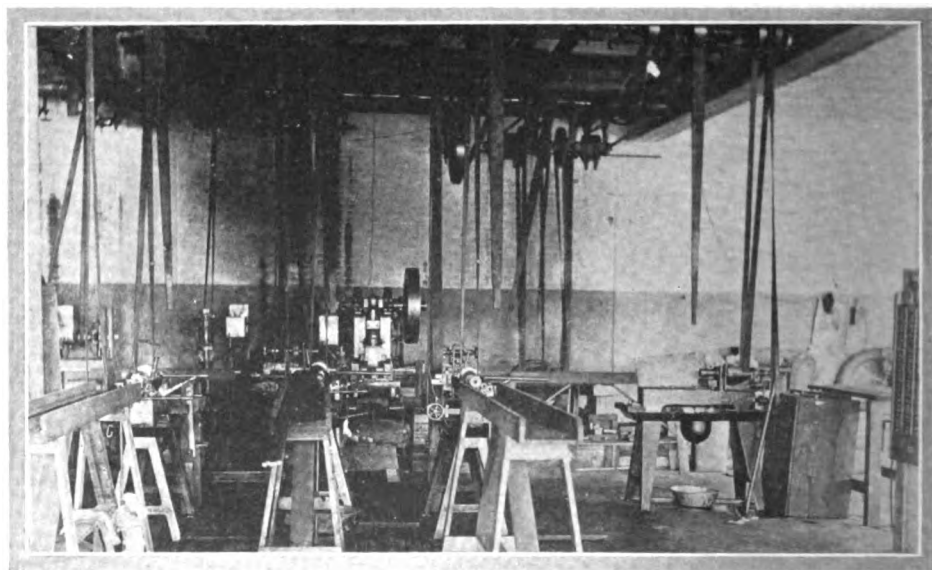
Chicago's New All-weather Bus.

tion of the new vehicle is a steel under-frame, and a body built of wood, aluminum and steel. The length of the car is 25 ft.; the width 7 ft. 6 ins.; height, from roadway, when unloaded, 12 ft., 11 ins. and 12 ft. 8 ins. when filled. The wheel base is 176 ins.; height of lower deck from roadway 12 3/4 ins. Both decks are lighted brilliantly from a generator driven by the engine. The vehicle is heated by exhaust gases from the engine which pass through pipes near the floor in the interior of the car.

From the view of municipalities, public utilities or other civic bodies, the new motor bus tends to minimize the probability of congestion in traffic by providing a means to transport passengers in larger numbers in a vehicle which occupies a minimum of space.

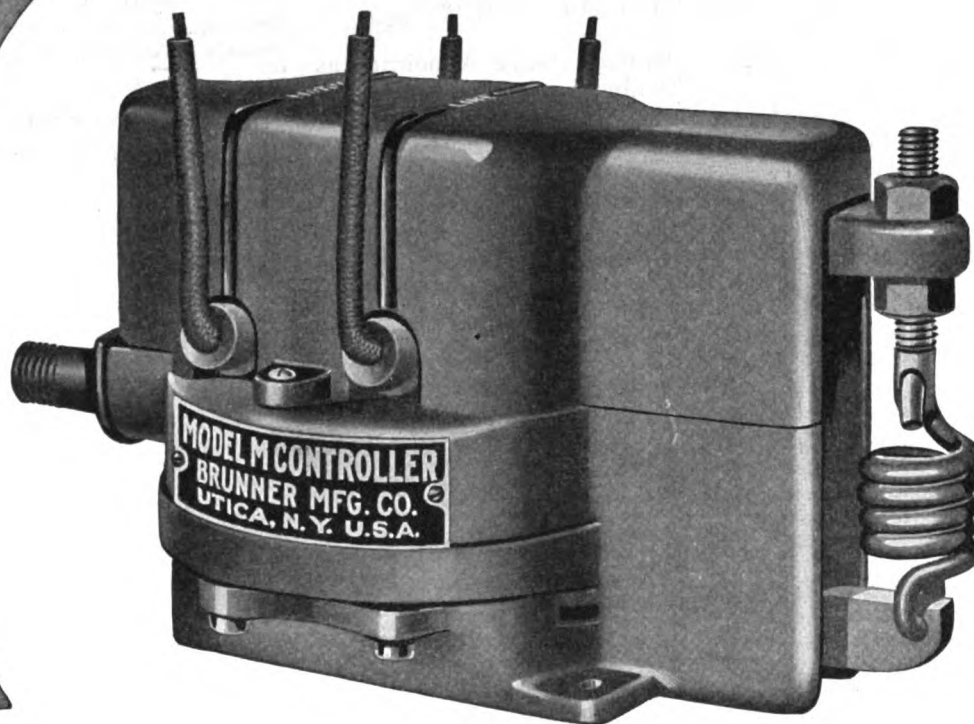
To Render Building Service to Automotive Dealers.

Mann & MacNeille, architects and construction engineers, have added to their organization an automotive department with headquarters in the Book Building, Detroit. This department is designed to render expert building service to automobile dealers, garagemen, repairmen and others engaged in retailing automotive mer-



Corner of Haney's Factory, Showing Automatic Machinery.

BRUNNER



Controlled Air Service

Your air compressor is in the back room---your profitable time is spent in the front. Suppose you start your compressor and are called away. What will happen if it is not automatically controlled?

- 1st - you may have to leave important, profitable work to go back to shut it off -- several times a day this happens. A Brunner Controller will pay for itself in the loss of time and profit.
- 2nd - If your compressor has safety valves, these will open when the proper pressure is reached then you are just pumping into the atmosphere - burning up current and wearing out your machine. A Brunner controller will prevent this.
- 3rd - If your outfit does not have safety valves, the pressure may reach the danger point. A Brunner controller will avoid damage and personal injury.

Suppose on the other hand you forgot or neglected to turn the compressor on, you'll have disappointed customers. A Brunner controller automatically maintains a proper working pressure which means every customer served without delay.

Here again Brunner engineers have designed a special type of controller to meet the most exacting requirements.

A Brunner controller will work on other Compressors - write for details, name your jobber.

BRUNNER MANUFACTURING COMPANY

MAIN OFFICE and FACTORY, UTICA, N. Y.

Branch Cincinnati, Ohio.

chandise, and is prepared to carry out work at any point in the country.

It is intended that this service shall be economical and within the reach of everyone from the largest to the smallest. The service rendered is complete, but any one of its natural divisions may be taken advantage of by those who are about to construct new buildings. These divisions of the work are as follows:

1. The provision of sketch plans showing exact floor layouts and appearance of the exterior of the building.
2. Working drawings, details and specifications together with cost estimates ready for the construction of the building.
3. The actual construction of the building as a direct service to the owner.
4. In case another organization builds from floor plans prepared, expert architectural supervision is furnished as a protection to the owner to see that specifications are properly met.
5. The complete equipment of the building.

Any part or all of this work is done under one service contract.

The experience of such an organization directed toward the solution of the dealer's problem in connection with the new building should prove an interesting and valuable innovation in the automotive field.

United States Air Compressor Co. to Increase Factory Facilities.

The new factory of the United States Air Compressor Co. is now nearing completion. This new factory which is being equipped with the latest modern machinery will triple the present manufacturing capacity and will handily enable the company to take care of the present great demand for its air compressors, especially the demand for the Giant Usaco De Luxe compressors which will inflate tires to 150 pounds pressure.

The manufacturers claim that this air compressor will deliver more air at higher pressure, in a shorter time and with less effort; the patented pressure release prevents burned-out motors; the filtering

trap or automatic air purifier guarantees air free from oil and moisture. The other valuable features are: fan-type fly-wheel intake silencer, belt idler, balanced check valve, tank safety valve, metal base, and the embodiment of the best material and workmanship assures the garageman, tire dealer, and service station a sturdy, capable, reliable compressor.

Write for information and prices to the United States Air Compressor Co., Cleveland, Ohio, mentioning the American Garage & Auto Dealer.

Capt. Percival Dodge Appointed as Denby Sales Manager.

Important among trade announcements is the appointment of Capt. Percival Dodge, as sales manager of the Denby Motor Truck Co., of Detroit, a position for which he has been in training for five years. Mr. Dodge entered the plant wearing overalls, worked at the bench, passed to assembly and inspection, experimental manufacturing, and went on the road, becoming district manager for Michigan. A term in the accounting department followed, then the war, during which he served as pilot at various flying fields in this country and six months in France.

Upon his return he became assistant treasurer, afterwards assistant sales manager, and now is in charge of all domestic sales. Mr. Dodge has won his spurs in every step through enthusiasm and energy and in Denby circles his promotion is welcomed as a deserved reward.

Black & Decker Mfg. Co. Opens Pacific Coast Office.

An additional office on the Pacific Coast, at 201 Maynard Bldg., Seattle, Wash., has been opened by the Black & Decker Mfg. Co.

This office is in charge of A. E. Nordwall, who is well known on the coast. Mr. Nordwall will have charge of the distribution of the Black & Decker products in the state of Washington, working under the direction of the main Pacific Coast office, 918 Hearst Bldg., San Francisco, Cal.

New Accessory Catalog, "Little Salesman," Ready for the Trade.

The New England Mills Co. has just issued the midwinter number of the "Little Salesman."

This new catalog of 48 pages lists and illustrates the latest and most practical equipment for Fords and a number of accessories for other cars. A copy of the "Little Salesman" will be sent to anyone in the trade writing for it to The New England Mills Co., 1219-1221 Michigan Avenue, Chicago, and mentioning the American Garage & Auto Dealer.

W. H. Metz to Represent Burd Co. in Iowa as District Agent.

W. H. METZ, the former representative of the Burd High Compression Ring Co. in the Detroit district, has recently been appointed to the position of district agent for the state of Iowa with headquarters in Des Moines.

Paragraphs.

STEVENS-DURVEA, following closely upon the culmination of far-reaching plans for expansion, announces the appointment of George E. Twitmyer as general sales manager. Mr. Twitmyer is well known in the motor car industry through his long years of devotion to the affairs of The Peerless Motor Car Co.

JAMES A. ABELES, well known in the automotive field as former vice-president and general manager of the Motor Car Equipment Co. and more recently organizer of an eastern house for the Beckley-Ralston Co. of Chicago, has recently joined forces with the Boyce-Veeder Corp., which will manufacture and market the new Boyce fire extinguisher.

THE ACME MOTOR TRUCK Co. announces that the complete Acme line of worm-drive motor trucks will be on exhibition at both the national automobile shows: New York, January 3-10; Chicago, January 24-31. The Acme line consists of 1, 1½, 2, 3½ and 5-ton models.



Model 502 Test Set
Price \$25.00 prepaid to you

We have openings for a number of live dealers.
Write for our free catalogue and dealer's proposition today.

H. E. PHILLIPS & CO., Union City, Ind.
(Formerly Phillips Engineering Co. and Auto Electric Systems Publishing Co., Dayton, Ohio.)

We Manufacture

electric testing, charging and magnetizing instruments for use in garages and service stations.

We publish the world's best book on motor car electric systems, showing circuit and wiring diagrams back to 1910. This book also contains instruction on elementary electricity, electric testing, etc., etc. Price delivered to you \$2.50.

GRAHAM SOCKET WRENCHES

Are turned from the best Solid Bar
Stock and are Heat Treated. For

STRENGTH and RELIABILITY

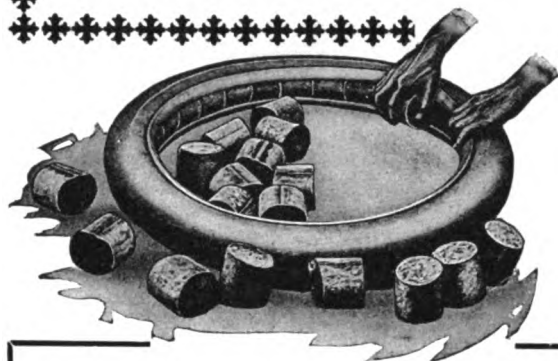
They are unexcelled. Ask for dealer's discount.

Price
\$1.50



Graham Roller Bearing Co., Coudersport, Pa.

End Your Tire Trouble Forever



IT brings new happiness and releases you from the horrors of expected tire trouble, making your car more delightful. Think of the joy of riding along without the eternal fear of a puncture or blow-out. Think of getting 10,000 to 20,000 miles out of every tire—no vulcanizing, no patching, no repairing of any kind, doing away with your inner-tube forever by installing in your tires this wonderful and economical

National Rubber Tirefiller

This marvelous substitute for air is being used by thousands and thousands of satisfied car owners throughout the United States and many foreign countries. We have been manufacturing and selling it for more than seven years; selling last year more than 35,000 sets.

National Rubber Tirefiller is made of the best grade of rubber, cut in small particles, treated, molded and vulcanized by our special steam process, in sizes to fit all standard makes of tires. It is laid in your tires and not melted and poured in. It can be transferred from one tire to another. It will not freeze, melt or harden—fully guaranteed against deterioration in any form, or being affected by atmospheric conditions.

Don't let prejudice stand in your way. Good business judgment demands that you at least make a careful investigation. Let us send you full information, sample and prices.

DEALERS—We have a fine proposition for you.

National Rubber Filler Company
210 College Street Midlothian, Texas



a carton of *Self-fluxing* SOLDER

Here is a solder that every auto repairman or auto owner should have. It completely does away with any form of a separate flux.

Kester Acid-Core Wire Solder

It has the flux right in it in a core of cells or little pockets. As solder is melted off, the flux flows to the job and insures the user of a perfect bond.

Handy and Big Time Saver

KESTER ACID-CORE WIRE SOLDER is always ready to use and eliminates the bother of preparing a separate flux. Many hours per week can be saved in garages and repair shops by using this in preference to the ordinary solder.

Get it from Your Supply House or mail Coupon to us for Free Sample

Sold in one pound coils in cartons, and on one, five and ten pound spools.

CHICAGO SOLDER COMPANY

MANUFACTURERS

218 N. Union Ave.

Chicago, Ill.

Pacific Coast Distributors:

SIERRA ELECTRIC CO., San Francisco, Cal.

FREE SAMPLE COUPON

A. G. & A. D. 12-19

CHICAGO SOLDER CO.,

218 No. Union Ave., Chicago.

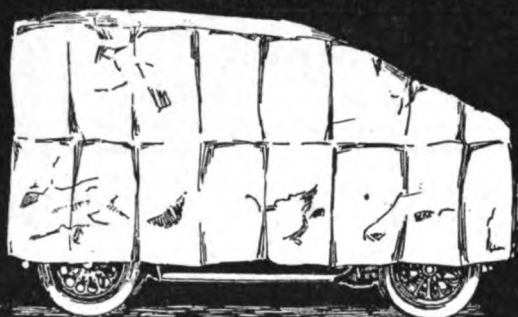
Gentlemen: Please send me a free sample of your KESTER ACID-CORE WIRE SOLDER.

Name

Address

City..... State.....

Our Supply House is.....



Fill your storage space this winter with **KENNEDY** Auto Covers

A nominal investment now will bring you a handsome revenue and keep your garage full to capacity during the winter months. You can also get the profitable repair and accessory business that will naturally follow.

KENNEDY AUTO COVERS offer the best and most economical means of protecting cars from dirt, dust, rust and cold. They will not only increase your storage business, but are quick sellers to car owners, who keep their cars in private garages.

Write today for prices and particulars.

The Kennedy Car Liner & Bag Co.
Shelbyville, Indiana



Add to this Hard Oilers, the Cantilever principle of construction and excellent workmanship you have the features that make W & C Original Double Aim Shock Absorbers so superior to the ordinary kind.

Their superiority is further demonstrated by the 200,000 sets now in use.

Price \$10 per set of four. Liberal dealer Profits. Write today for particulars.

Chicago Sales Office:

Walter Eckhouse & Co.
616 S. Michigan Ave.

**P.H. WEBBER
COMPANY**



**HOOPESTON
ILLINOIS.**

GANSCHOW GEARS

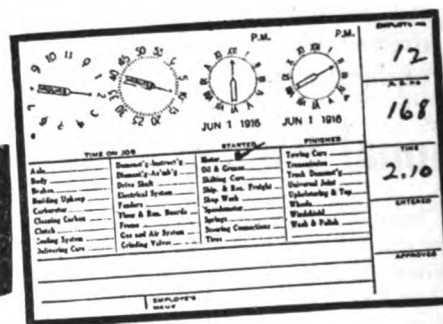
for service and reliability

The quality of our gears is almost proverbial in the automobile trade. Our unexcelled facilities and broad experience enable us to give you the most efficient service and engineering advice on every kind of automobile gears and transmissions.

We are prepared to furnish promptly transmission, differential and timing gears, and any other parts made from either open hearth, nickel, chrome vanadium or any other alloy steel, for any car of either American or foreign manufacture. Workmanship and quality guaranteed.

Write today and feel free to consult our Engineering Department.

Wm. Ganschow Company
1002 Washington Boulevard
Chicago, Illinois



**No profits lost if you
CALCULAGRAPH
your garage work**

When the time spent on repair jobs is "estimated" by the men there are bound to be errors. On some of these YOU lose. In course of a year these losses run into a considerable sum.

When you install a CALCULAGRAPH these losses cease because you have an accurate record of the actual time spent on every repair job.

Write for booklet.

The Calculagraph Company
Dept. 77
30 Church St.
NEW YORK CITY





**Introducing the
Latest Idea**

ROTARY AIR COMPRESSORS

For All Purposes

ADVANTAGES WORTH CONSIDERING

Slow Speed. No Vibration. Positive Displacement.
High Overall Efficiency. Very Low Cost of Upkeep.
No Expensive Foundations.

Easy to Install. Perfectly Balanced. Quiet in Operation.

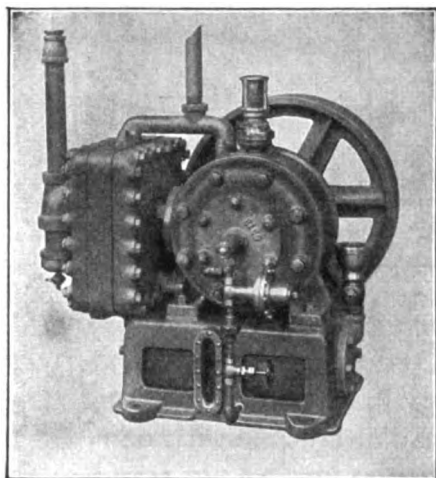
Check Valves on Discharge. No Valves on Intake.
Simple to Operate.

*Weights Less Than One-Half of Other Types.
All Bearings Hyatt Roller—"High Duty." Only
Five Moving Parts Always Running in Oil.*

Write for Descriptive Matter, Prices and Delivery

JACKSON COMPRESSOR COMPANY

Denver, Colorado, U. S. A.



Rotary Garage Compressors

You get a good share of the profit.

The **MODEL "N" MARVEL CARBURETER** improves car performance, and increases mileage from 22 to 25 miles per gallon.

No changes are necessary to install it. Fits right in place of regular installation.

MARVEL CARBURETER

Designed especially for FORDS

sold on 30 days' trial, with money back if not satisfactory.

Price F. O. B. Factory \$10.00

MODEL "E" CARBURETERS are standard on Buick, Oakland, Nash, Scripps Booth, GMC, Wilson and all $\frac{3}{4}$ -ton U. S. A. Government Trucks.

MODEL "E" Carbureters greatly improve Maxwell, Overland, and Studebaker cars.

DEALERS--If interested, write for further information

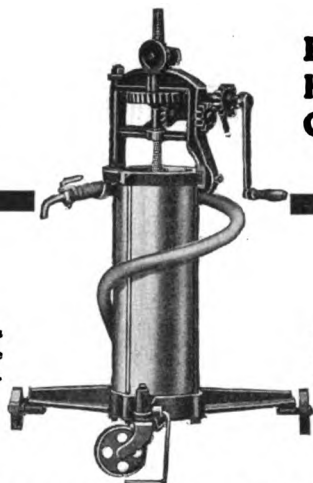
MARVEL CARBURETER COMPANY
FLINT, MICHIGAN, U. S. A.



**POURS
OUT
STEADY
PROFITS**

**ENTIRELY
HAND
OPERATED**

Model K holds
20 lbs. grease
or 2½ gals. oil.



Model N holds
56 lbs. grease
or 7 gals. oil.

Ekern "Model N" Portable Garage Grease Gun

Undoubtedly there is scarcely any garage equipment which is absolutely indispensable; yet there are a few products which come mighty close to being necessary. Among these, our "MODEL K" and "MODEL N" PORTABLE GARAGE GREASE GUNS are very prominent.

Address us today for full particulars.

H. G. Paro Co.

**1412-14 South Michigan Blvd.
CHICAGO, ILL.**

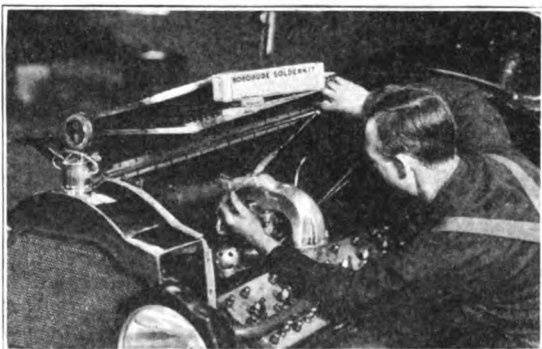
GARAGE



**A. Schrader's Son,
Brooklyn N.Y.**

Kindly hurry that order for Inflating Valves. We had no trouble with our Free Air Station as long as we used this Valve but when we had to put in another make,—the fun began.

EXTRACT FROM ACTUAL LETTER RECEIVED.



NOKORODE is your best helper on any job that involves soldering

A defective bit of soldering will spoil any repair job. Manufacturers and repairmen who realize the importance of perfect soldering use NOKORODE Soldering Paste. This paste is compounded so carefully that it insures perfection on any soldering job.

*Have you a supply in your shop?
If not write today for sample and prices.*

The M. W. Dunton Company
Providence, R. I., U. S. A.

Pondelick Brothers

**will
pay \$100**

if they fail to duplicate any part of any make of automobile or truck foreign or domestic, submitted to them. That sum will be paid to the person sending the order.

Parts of any machine can be duplicated in 1 to 3 days' notice. All welding is done at their risk. Do not compare this work or welding with that of others. If you have a broken part or parts that others cannot weld or repair, send them to Pondelick's. They increase the durability of many parts—even where the manufacturers fail.



Supply your customers with "Pondelick's" anti-leak piston rings, and you insure them against engine trouble.

They have the largest and best equipped plants in the United States for the repair or reproduction of automobile parts.

Cylinder regrinding, new piston, special casting, heat treated, Pondelick's self-adjusting, anti-leak piston rings, new wrist pin, hardened and ground, bushing made of genuine bronze, including fitting and assembling of connecting rod to piston for \$15.00.

Reputation, not competition, determines our policies. Visit our plants and be convinced. Ask anywhere or anybody about our work.

General Factory, 5100 to 5112 West 16th St.
Main Office, Leavitt St. and Jackson Blvd.

Pondelick Brothers, CHICAGO ILLINOIS

STOP RACING YOUR ENGINE



The **EWALD** **FOOT ACCELERATOR** **FOR YOUR FORD CAR**

RACING your engine without a load will do more damage to your motor than hundreds of miles of travel, to say nothing of the gasoline wasted.

With an Ewald Foot Accelerator the speed of your engine is entirely controlled with the foot. When you take your foot off the accelerator to apply the brakes your engine slows down instantly.

It leaves your hands free to operate the wheel, brakes and horn, and insures safety first. Aside from the economical and safety features the Ewald Foot Accelerator adds tremendously to the pleasure of driving your Ford car. Over 50,000 now in use. Guaranteed for the life of the car.

PRICE - - - - - **75 Cents**

MANUFACTURERS

SALES DEPT.

ROMORT MFG. CO. THE ZINKE CO.
OAKFIELD, WIS. 1323 MICHIGAN AVE.

THE service the tractor gives the user depends entirely upon the lubrication. Inaccessible parts can be lubricated with either hard or soft grease with the Rose Tractor Taper Nozzle Grease Gun. 19½" long by 1½" diameter.

List Price \$2.50

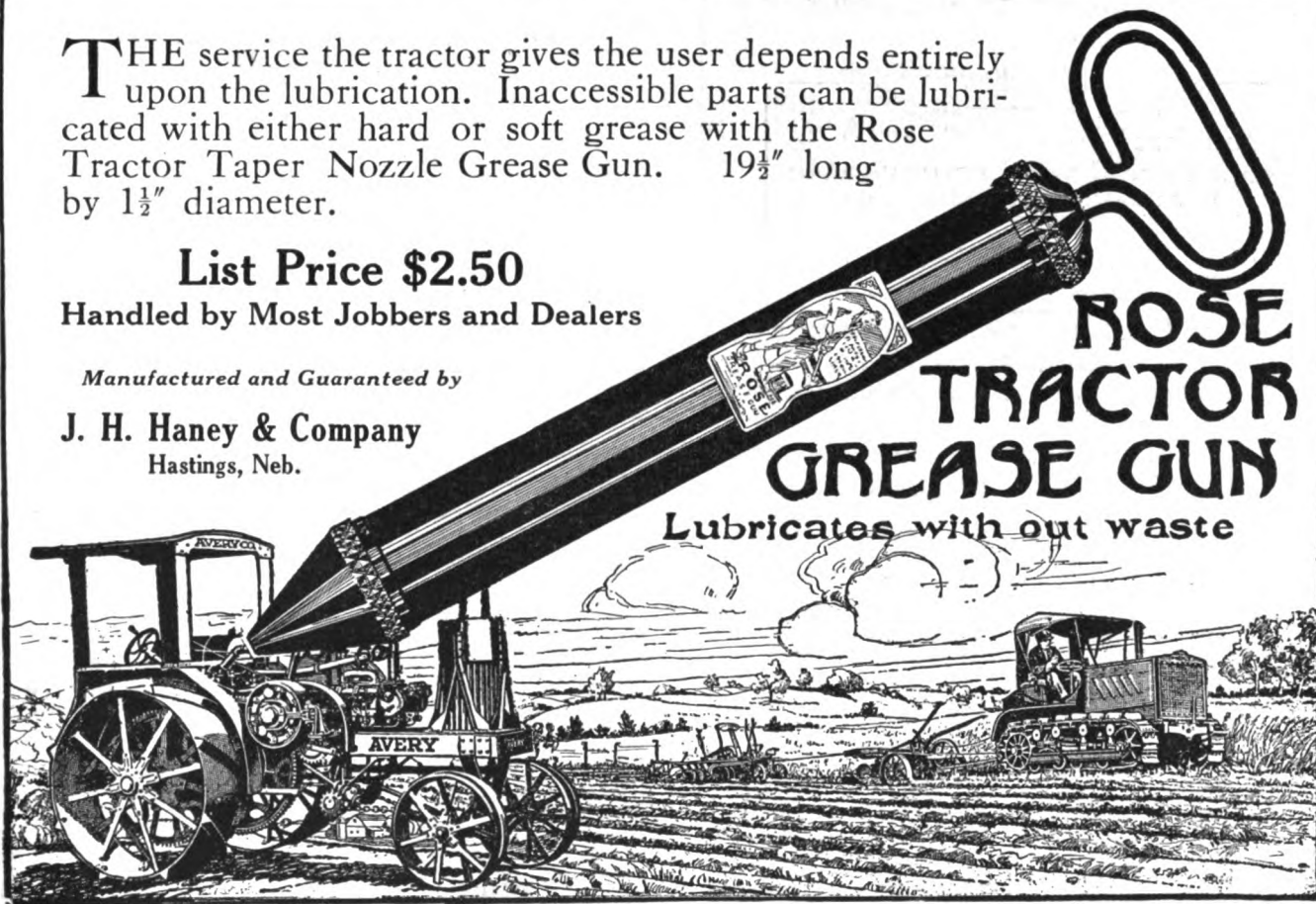
Handled by Most Jobbers and Dealers

Manufactured and Guaranteed by

J. H. Haney & Company
Hastings, Neb.

ROSE
TRACTOR
GREASE GUN

Lubricates with out waste



Give the AMERICAN GARAGE AND AUTO DEALER Credit When Writing Advertisers.

Underground Gasoline Storage Tanks

Built to Underwriters' Specifications

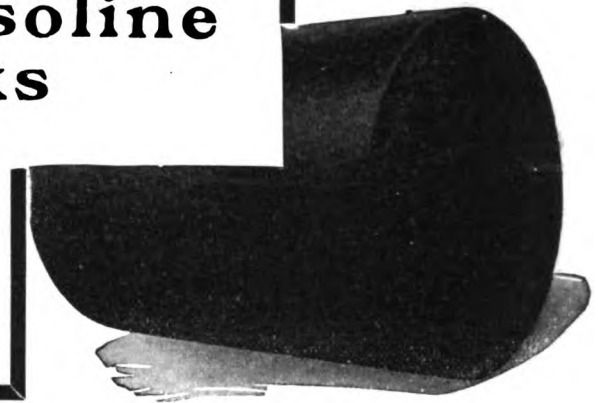
Sold at "attractive" prices

Write for quotations to

DINES & FOUTCH

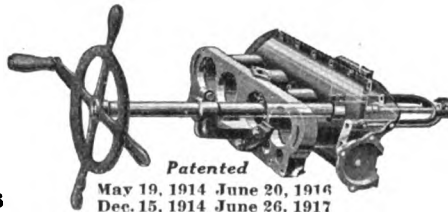
301-302 Unity Building

SPRINGFIELD, ILL.



REPAIRMEN — LISTEN!

The Heiser Improved Cylinder Reboring Tool for Ford Motors



Patented
May 19, 1914 June 20, 1914
Dec. 15, 1914 June 26, 1917

is the only Reboring Tool in the world that is self sharpening. It is the only Tool except expensive grinders that will not leave the finished cylinder slightly tapered toward the bottom. It is the only Tool that rebore between centers—this insures a finished cylinder, square with the crankshaft, round, straight and true. It is adjustable, and the only Tool that will rebore different sizes without losing the adjustment.

The best mechanic in the world can't build reputation without proper TOOLS and EQUIPMENT. The HEISER IMPROVED CYLINDER REBORING TOOL makes good shops out of poor ones and better shops out of good ones.

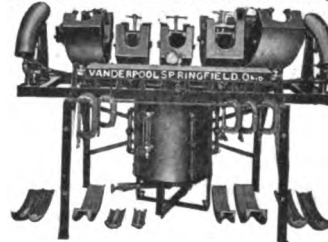
Write today for full particulars.

Heiser Special Tool Co., 115 Rogers Bldg., Kingston, Mo.

OPEN A TIRE REPAIRING SHOP!!

BUSINESS GOOD AND FAST GROWING

VANDERPOOL VULCANIZER (5 Cavity) has capacity of \$100 worth of work a day. We are the pioneers in the manufacture of the Dry Cure Vulcanizer.



With the VANDERPOOL VULCANIZER no experience is necessary. We give you free instructions. Write today for FREE TIRE REPAIRING MANUAL and full particulars. If others can be successful, so can you be. Write today.

In answering address
Dept. G-20.

Wm. Vanderpool Co., Springfield, Ohio

They DO Stop the Breakage

Comfort Combined with remarkable Squeakless Resiliency

New Era "Better" Springs are graphited between leaves, affording two years' lubrication.

Are guaranteed, without restriction, for one year, against sagging and breakage. Positively match any other Spring in load depression.

Write for further information, including nearest jobber's address.

— New Era Spring & Specialty Company

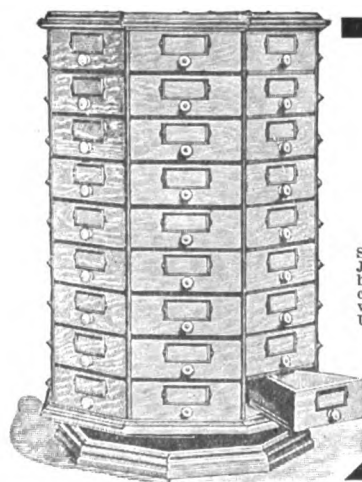
1152 Hamilton Ave. Grand Rapids, Mich.

Pay for a Bermo welding plant out of your Profits

Every successful garage should have a welding plant. The BERMO is clearly the most logical one, for they are made to conform to any size or style required and are sold on cash or terms.

You may have from three to six months, if necessary, to pay (in small installments).

A. G. BERMO CO.
OMAHA -- NEBRASKA



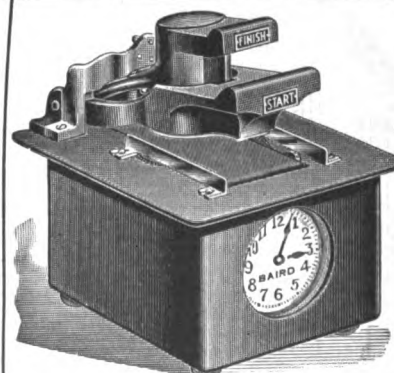
Keep your supplies in revolving cabinets like these

Systematic! Conveniently Accessible! Just like "rolling off a log" to look up bolts, screws, etc., with this revolving cabinet. Everything at your finger tips, with nothing to burden your memory. Used by leading garages of this country.

Buy today from your jobber.
Catalogue on request.

American Bolt & Screw Case Co.
DAYTON, OHIO

Put your repair charges on a profitable basis with



BAIRD TIMING DEVICES

Keep a check on your employees' time and learn exactly what each job costs. Automatic supervision turns losses into profits.

Prices moderate.
Write today for booklet.

Baird Equipment Co.
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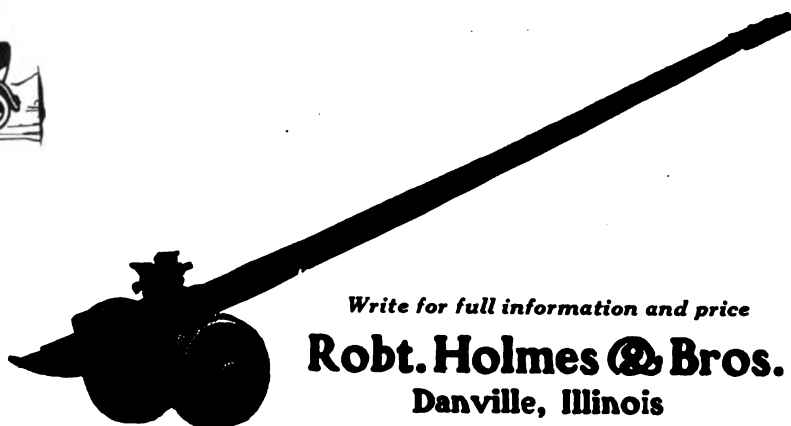


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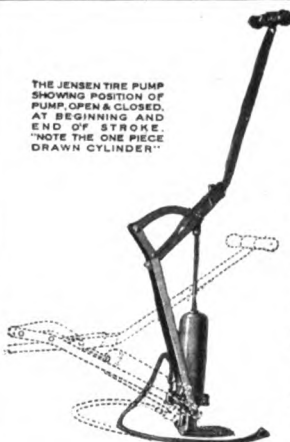
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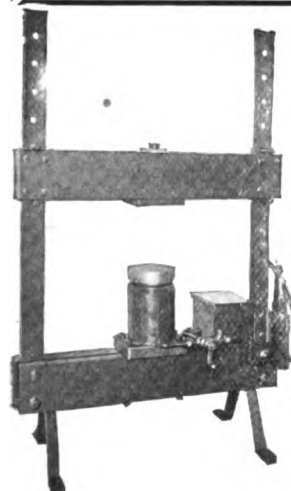
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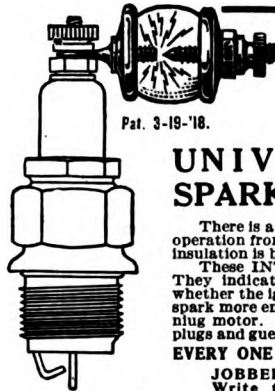
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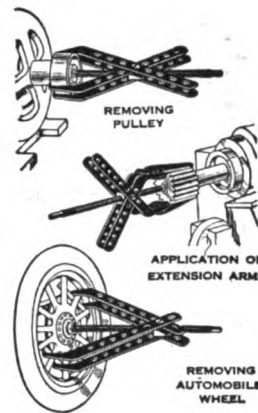
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The Graham Roller Bearing Co., Coudersport, Pa.
Sawyer Sales Co., 50 Terminal Bldg., Lincoln, Neb.

Index to Advertisements

| A | | K | |
|--------------------------------|----------|-------------------------------|-----------|
| Advance Automobile Access- | — | Kennedy Car Liner & Bag Co.. | 68 |
| American Bolt & Screw Case | 72 | L | |
| Co. | 72 | Lawrence & Co., L..... | — |
| American Machine Products Co. | 73 | Live Poultry Transit Co..... | 74 |
| American Technical Society... | 45 | Lourie Mfg. Co..... | 66 |
| Atlas Auto Supply Co..... | 51 | M | |
| Auto Compressor Co..... | 74 | McDaniel Rubber Co., Leo.... | 77 |
| Auto Engine Works..... | 74 | Marvel Carburetor Co..... | 69 |
| Auto Wrecking Co..... | 74 | Marvel Machinery Co..... | 8 |
| Automatic Safety Tire Valve | 49 | Melxell Co. | 5 |
| Corp. | 49 | Mill City Co. | — |
| B | | Miller Rubber Co..... | 75 |
| Bailey-Drake Co., Inc..... | — | Mutual Truck Co..... | — |
| Baird Equipment Co..... | 72 | N | |
| Beck & Corbitt Iron Co..... | 75 | National Cash Register Co.... | 63 |
| Berno Co., A. G..... | 72 | National Rubber Filler Co.... | 67 |
| Boe Co., H. M..... | 65 | National Wire Wheel Works.. | 59 |
| Brunner Mfg. Co..... | 74 | New Era Spring and Specialty | 72 |
| Butler Mfg. Co..... | 74 | Co. | 72 |
| Burgess Mfg. Co., W. S..... | 77 | New York Coil Co..... | 75 |
| C | | No-Leak-O Piston Ring Co.... | 75 |
| Calculagraph Co..... | 68 | Norma Company of America, | 4 |
| Casco Manufacturing Co., | — | The | 4 |
| Inside Front Cover | — | O | |
| Casey-Hudson Co..... | — | Owens, Frank Chas..... | 75 |
| Cassidy Co., Edward A..... | 75 | P | |
| Catelain, Andre G..... | 75 | Paro, H. G., Co..... | 70 |
| Champion Pneumatic Machin- | — | Phillips, H. E. & Co..... | 66 |
| ery Co., Inside Back Cover | 67 | Ponderick Bros. | 70 |
| Chicago Solder Co..... | 67 | Premier Electric Co..... | 75 |
| Coffield Tire Protector Co.... | 43 | R | |
| Curtis Pneumatic Machinery | 39 | Reliance Co. | — |
| Co. | 39 | Romort Mfg. Co..... | 71 |
| D | | S | |
| Dellafield Co., Jos..... | 74 | St. Paul Auto Cylinder Grind- | 75 |
| Denby Motor Truck Co..... | 70 | ing Co. | 75 |
| Dunton Co., The M. W..... | 70 | Sawyer Sales Co..... | — |
| Dines and Fouch..... | 72 | Schrader's Sons, Inc., A..... | 70 |
| E | | Shaler Co., C. A..... | 74 |
| Ever-Tight Piston Ring Co... 7 | 7 | Standard Auto Salvage Co.... | 74 |
| F | | States Chemical Co..... | — |
| Fairbanks Company | — | Stenman Electric Valve Grind- | — |
| Famous Tires Corp..... | — | er Co. | — |
| Federal Electric Co..... | — | Storm Mfg. Co..... | 53 |
| Flexlume Sign Co., Back Cover | 75 | Sunderland Machinery & Sup- | 74 |
| Foster Bros. Mfg. Co..... | 75 | ply Co. | 74 |
| G | | T | |
| Ganschow Co., William..... | 68 | Trexler Co. | — |
| Garden City Spring Works..... | 77 | Trione Piston Ring Co..... | — |
| General Utility Co..... | 6 and 55 | Tubular Woven Fabric Co.... | 77 |
| Globe Mfg. Co..... | 61 | Tungsten Mfg. Co..... | — |
| Graham Roller Bearing Co., | — | U | |
| The | 66 | Universal Battery Co..... | — |
| Gray-Heath Co. | 74 | Universal Mfg. & Sales Co.... | 75 |
| Greer College of Motoring.... | 74 | U. S. Air Compressor Co.... | 47 |
| H | | Utilities Sales Corp..... | 6 and 55 |
| Halladay Co., L. P..... | — | V | |
| Haney & Co., J. H..... | 71 | Vanderpool Vulcanizing Co.... | 72 |
| Harvey Spring & Forging Co.. | 57 | W | |
| Haywood Tire & Equipment | 78 | Wagner Specialty Co..... | 75 |
| Co. | 78 | Warshawsky & Co..... | 74 |
| Helser Special Tool Co..... | 72 | Waxit Mfg. Co..... | — |
| Hinckley Machine Works..... | — | Webber & Co., P. H..... | 68 |
| Hobart Bros. | 73 | Weston Electrical Instrument | 73 |
| Holmes & Bros., Inc., Robert.. | 73 | Co. | 73 |
| Howell Co., The W. H..... | 73 | Wood & Safford Machine Wks. | 77 |
| I | | Zinke Co. | 71 and 77 |
| Inland Machine Works..... | — | J | |
| J | | Jackson Compressor Co..... | 69 |
| Jackson Compressor Co..... | 69 | Jenkins Vulcan Spring Co.... | 41 |
| Jenkins Vulcan Spring Co.... | 41 | | |

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HAYWOOD'S LATEST INVENTION

Here it is:

A new machine that will earn from \$100.00 to \$150.00 per week in any well-established tire repair shop. More than one year of constant experimenting and development work was required to complete it.

Statistics say there will be **One Billion Dollars'** worth of tires worn out this year. The insistent demand for re-treaded tires that would add 3,000 to 4,000 more miles of wear is growing. A new and better machine than had so far been produced was needed.

HAYWOOD'S
Silvur Lined
MOLD

meets the need. Made of white metal—die cast—absolutely free from blemishes and smooth as glass. It is truly a wonderful machine.

Old tires retreaded on this machine closely imitate the runner, **cord type**, and are smooth, classy, bright. All 4,000 owners of Haywood Tire Repair plants will **want** this new Haywood invention. Owners of other plants should have one.

**PAYS FOR ITSELF
IN A WEEK**

Will earn from \$100.00 to \$150.00 weekly. Are you an auto tire repairman? If you are not, why not enter this profitable business? Tire repairmen earn **\$2,500 to \$4,000 per year**. Many are doing better; some up to \$6,000 and \$7,000 per year. If you have a tire repair shop you need this Haywood Silvur-Lined Retread Mold. You should write us at once and get the details. It will pay for itself in a week. Every week thereafter you should make \$100.00 or more extra profit.

FREE BOOK

I have an interesting book to send you that tells about tire repairmen and the Haywood method. It tells about automobile tires—it gives inside facts that you should know about profits. When you write tell me if you have a tire repair shop or, if you want facts about the tire repair business. Address

M. HAYWOOD

Haywood Tire and Equipment Co.
650 No. Capitol Ave., INDIANAPOLIS, IND.

WRITE ME!

I will tell you how to start in business as an expert tire repairman and earn \$2,500 to \$4,000 per year. Sounds too good to be true. But it is true every word of it.

M. HAYWOOD

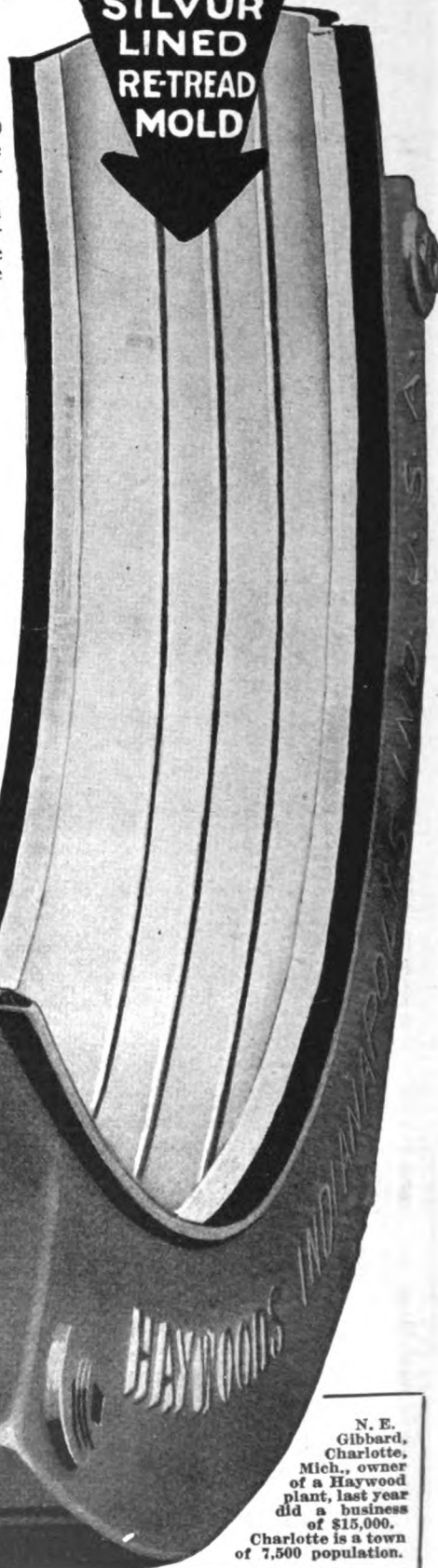
Haywood Tire and Equipment Co.
650 No. Capitol Ave., Indianapolis, Ind.
(Mark an X for interest in either or both subjects)

- ☐ Send facts about the Silvur-Lined Mold.
☐ Send facts about the Tire Repair business.

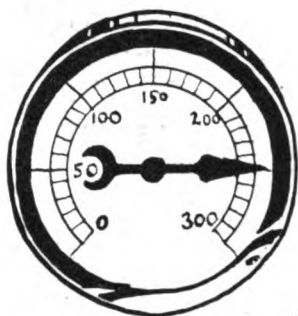
NAME

ADDRESS

**SILVUR
LINED
RETREAD
MOLD**



N. E. Gibbard, Charlotte, Mich., owner of a Haywood plant, last year did a business of \$15,000. Charlotte is a town of 7,500 population.



Equal to the Task

The big truck tires that are daily becoming more numerous on our highways, have inaugurated a new standard of air compressor service. Garages and service stations must be equipped to furnish air at from 150-250 pounds pressure.

CHAMPION AIR COMPRESSORS

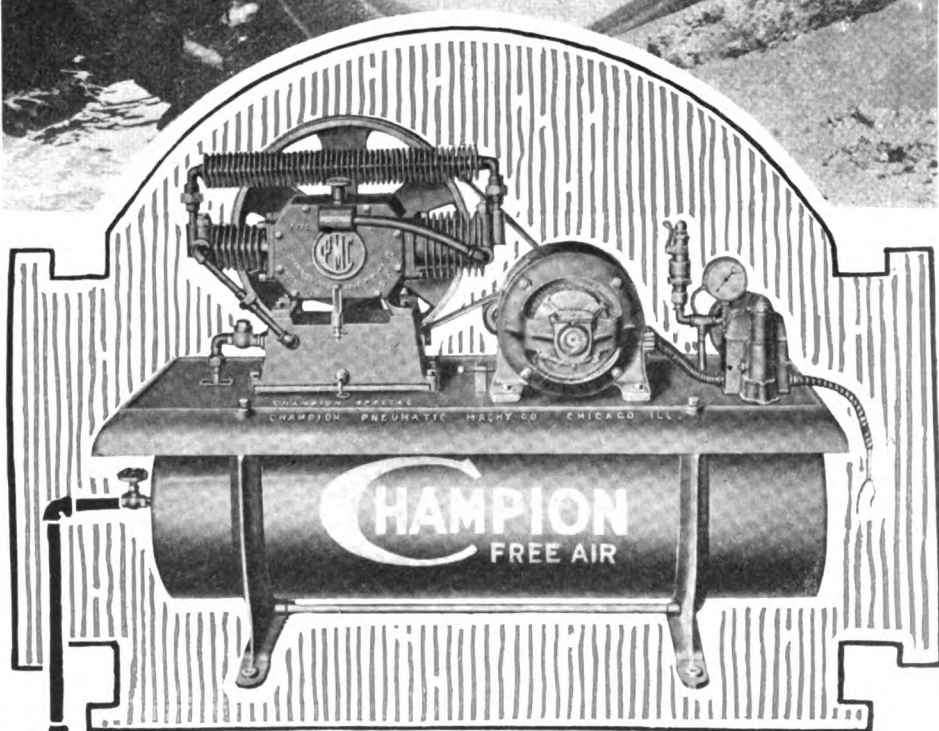
are made to fully meet these new requirements of air service. The tank furnished with the Champion Special Automatic Air Unit is tested for 250 lbs. working pressure, assuring ample power for inflating the largest truck tires.

Champion Air Compressors are ready for prompt delivery. Write today for full information and prices.



**Champion Pneumatic
Machinery Co.**

1402 South Michigan Avenue
CHICAGO





Electric Advertising—The Oplex Kind—Pays Big Profits

SALES AGENTS have found they sold more cars; that they were better known in their territories, after they had installed Oplex electric signs. Garage operators find the same thing—more business, better standing. These are simple facts you can verify for yourself. Just talk to the man who has an Oplex Sign above his door.

The answer is that Oplex electric advertising is exactly the kind of advertising the dealer and garage man need—advertising which reaches almost exclusively their own possible buyers at a cost of only a few cents per thousand, and at the same time advertising which suggests quality.

Oplex Signs have snow-white, raised, glass letters, standing out from a dark background, which makes them perfect day signs as well as electric night signs. Any trademark can be perfectly reproduced in raised, Oplex characters.

Won't you let us send you a sketch, showing how your sign will look?

THE FLEXLUME SIGN CO.

ELECTRICAL ADVERTISING
Niagara Street and Potomac Ave., Buffalo, N. Y.

Pacific Coast Distributors:
Electric Products Corp. Los Angeles, Cal.
Canadian Distributors:
The Flexlume Sign Co. Ltd., Toronto Can.



